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The Journal OF Nervous and Mental Disease

An American Journal of Neurology and Psychiatry, Founded in 1874

Original Articles

RUPTURE OF THE SPINAL CORD IN DYSTOCIA

By DR. F. H. KOOY,

PSYCHIATRICAL AND NEUROLOGICAL CLINIC OF THE UNIVERSITY, GRONINGEN,
HOLLAND

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Lesions of the central nervous system in children born by forcipal extraction or some other obstetrical manipulation have often been described; cerebral lesions of that kind are in fact well known. Also descriptions of lesions of the spinal cord, though certainly less generally known, are occasionally met with in literature dating from 1870, when Parrot for the first time mentioned rupture of the cord in consequence of difficult birth.

Still the case, which I intend to discuss in this paper, is unique, as it deals with an almost total rupture of the spinal cord, while the child survived the trauma for nearly nine years.¹ Seeing that the

¹ As far as I know, four months is the longest survival in analogous cases, as recorded in literature (*Lawetschek*, 1911).

case also offers some remarkable neurological peculiarities, its description may be sufficiently justified.

Historia Morbi.—D. P., a child of the feminine sex, was born on January 26, 1910. The first child of the mother, being in transverse presentation, was born by version and extraction; the second child was born by the same manipulation; the third and the fourth child were born spontaneously, but the fifth, our patient, being in transverse position, was again born by version and extraction. The doctor, when summoned, stated a first cross-presentation (dorso-anterior) and a prolapse of the umbilical cord and of one arm; the dilatation of the os externum was 7 cm. The child lived; version and extraction were performed, and by Müller's method, the after-coming shoulders were delivered. The head offered some difficulties, the child was asphyctic and was revived with some difficulty. The method used was not stated.

Three days post partum, the mother noticed three ulcers on the child's rump, which grew rapidly larger and deeper. Soon afterwards she observed that the child moved its legs only feebly. According to the mother, the child had never been seen to move its lower legs, feet or toes, but she is sure that the child could flex the thighs on both sides, though only weakly. She had not tested the sensibility, but the child, when 1½ years old, had burned its lower leg seriously, without feeling any pain. Though it grew up prosperously (except for the lower extremities, of course) and appeared to be very intelligent, it continued to show a complete incontinentia alvi et urinæ.

July 2, 1912: On account of the paralysis of the legs and the decubitus, the child was brought to hospital on September 11, 1912.

Of the status præsens, I have found the following notes: The head and the arms are quite normal. Intellect also normal.

Motility.—The legs are spastic and paretic, both can be moved very weakly (unfortunately it was not noted what muscles still functioned). Walking and standing quite impossible.

Reflexes.—The knee and ankle-jerks of both sides are greatly exaggerated. The phenomenon of Babinski is positive on both sides.

Sensibility.—The tactile sense does not seem to have been examined (perhaps the child was too young to give correct answers).

Pain sense not completely lost in the legs, but much decreased.

Thermic sense lost in the legs and the gluteal region.

Deep sensibility not examined.

Large and deep *bedsore* on the sacrum.

During its stay in the hospital, the child had a spontaneous frac-

ture of the right femur-diaphysis (excellent consolidation with luxuriant callus-formation, which is afterwards resorbed).

No visible or palpable abnormalities of the vertebral column; neither on the Röntgen-photograph.

August 26, 1914: Of the polyclinical examination on August 26, 1914, I only found the note: status unchanged.

July 2, 1917: On July 2, 1917, the little patient was again admitted to the hospital.

Status Præsens.—Head, arms, thorax and abdomen, back and vertebral column quite normal, but for a lordosis of its lower part; the Röntgen photo again does not show any abnormality.

Abdominal reflexes present on both sides.

Lower Extremities.—Both legs are completely paralytic, muscular contracture in hip and knee-joint; all passive movements in the ankle-joints, however, are amply possible; the musculature of the lower leg is atonic.

Reflexes.—Knee-jerks are diminished and the ankle-jerks are abolished. The symptom of Babinski has disappeared on both sides.

Electric Reactions.—Complete abolition of electric excitability on both sides, but for a slow contraction of the m. tibialis anterior and of the m. m. peronei as a response to the galvanic current.

Sensibility.—Tactile sense probably not quite lost in the upper legs; the lower legs are totally anesthetic. Pain sense perhaps not quite absent in the upper legs, but also here, it is at least greatly diminished. An abscess was incised a little above Poupart's ligament without the patient's feeling any pain; when it was over, she asked whether the operation had already begun.

Lower legs in any case quite analgetic. Thermic sense and deep sensibility not examined.

Decubitus at the sacrum very large and deep.

Incontinentia alvi et urinæ, cystitis.

September 27, 1918: The child was again admitted to the hospital; bedsores and cystitis had grown considerably worse. Same neurological status præsens, only this time the knee-jerks were found absent as well as the ankle-jerks.

The patient died on October 8, 1918, from pyæmia.

The diagnosis was a lesion of the spinal cord, probably in consequence of dystocia. The absence of any vertebral abnormality and the long survival of the child after such a serious lesion of the cord, made the diagnosis somewhat dubious.

Résumé of the Historia Morbi.—Summing up the principal facts of the historic morbi, we note: a child was born by version and ex-

traction, the birth was very difficult. This child always suffered from bedsores; from total paralysis of the lower legs and from incomplete paralysis of the upper legs, of which it is certain that the m. m. iliopsoas were able to contract during the first years; from total anesthesia, analgesia and thermanesthesia of the lower legs and from, at least, an almost total loss of sensibility of the upper legs; probably the pain-sense had been abolished up to the thoracic segments; finally, from complete incontinentia alvi et urinæ.

Post-Mortem Examination.—The following points in the report of the autopsy are important: the decubitus has penetrated the sacrum, the vertebral column shows no abnormalities, neither can any trace of an old luxation or fracture of the spine be found after a careful examination.

Outside the dura no peculiarities.

When the dura was opened caudo-orally, the scissors came to a point of resistance on the level of the seventh thoracic vertebra. In a transverse section, it appeared that the meninges were fused here and surrounded the very small medulla as a thick solid fibrous ring. The spinal cord and the cerebrum were then taken out and put in formol 10 per cent., for microscopical examination.

Microscopical Examination.—But for a part of the medulla cervicalis, the whole spinal cord was examined in serial sections, alternatively stained after van Gieson and Weigert-Pal.

Examination of the Place of Lesion.—Fig. 1 shows a section at the level of the greatest lesion. It appears that nearly the whole spinal cord has disappeared (this is even more apparent in other sections) and that it has been replaced by connective tissue, consisting of a network of fibers, between which small isles of glia (fibers and darkly stained cells) are found. At the right lateral border of the cord lies a small strand of glia without nerve fibers and at the left border, a larger strand of glia, in which still occur a very few nerve fibers at the extreme periphery. The examination of serial sections (in both directions) makes it clear, that these nerve fibers chiefly belong to short (intra-medullary) tracts.

The only remaining tract belongs to the right anterior column, directly adjacent to the antero-median fissure, and, on tracing it further in serial sections (in a caudal and oral direction), it appears that it corresponds to the ventral part of the direct (ventral) pyramidal tract; it has an oval form and it is surrounded by a glia-ring.

A part of the section of Fig. 1 is reproduced greatly magnified in Fig. 2, showing the small tract in question and the connective tissue, which has replaced the nervous tissue.

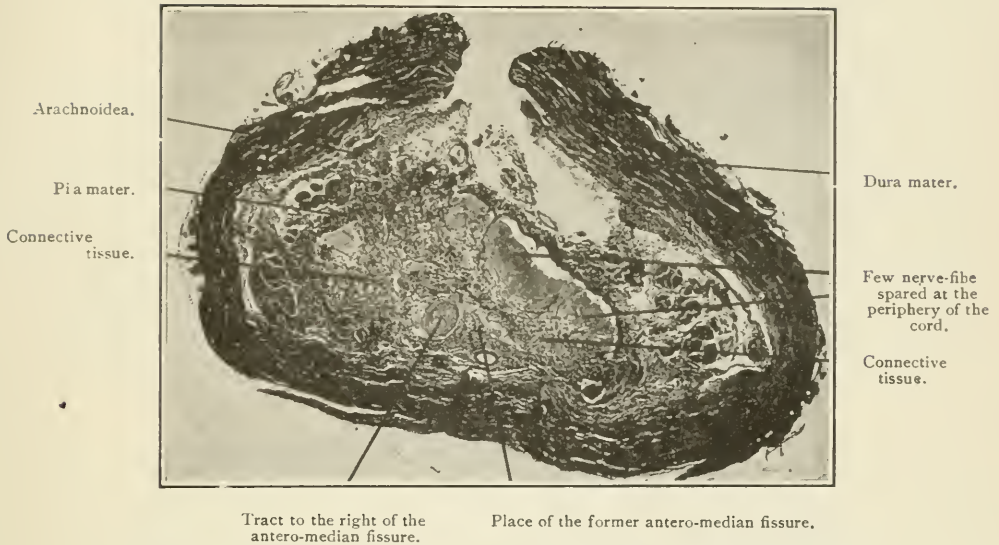


FIG. 1. Section at about the level of the greatest lesion. Hyperplastic leptomeninges. Of the spinal cord, only a small tract to the right of the antero-median fissure has remained intact. At the border of the cord only a few nerve-fibers, belonging to the left posterior column and the adjacent part of the lateral column are spared. (Paraffin; van Gieson stain.)

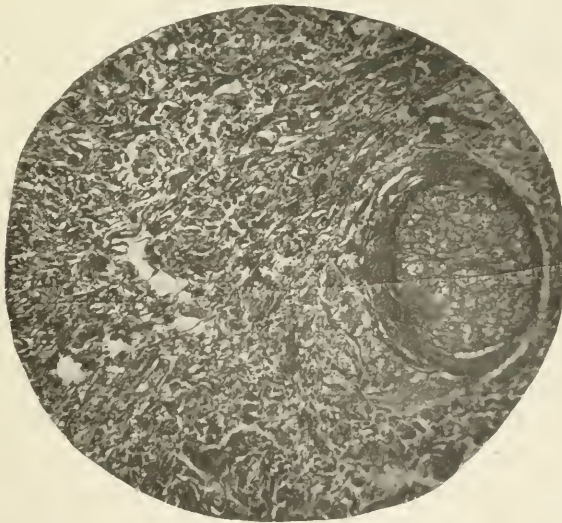


FIG. 2. Showing a part of Fig. 1 (containing the intact ventral pyramidal tract), greatly magnified.

Over a distance of about $\frac{3}{4}$ cm. the aspect remains the same, then, following the serial sections orally and caudally, the form of the medulla again becomes recognizable; the pia is still hypertrophied, the spinal cord itself remains nearly totally degenerated. The connective tissue is found most at the places where the roots (especially the anterior ones) leave and enter the cord. This makes it seem as if the spinal cord had been torn asunder by pulling at the roots.

I shall afterwards return to this question.

In anticipation, I want to refer, however, to Fig. 7, showing a section, orally to the lesion, which demonstrates this fact.

Descending Degeneration.—Examining now the serial sections in a caudal direction, we see the posterior column's first redress.

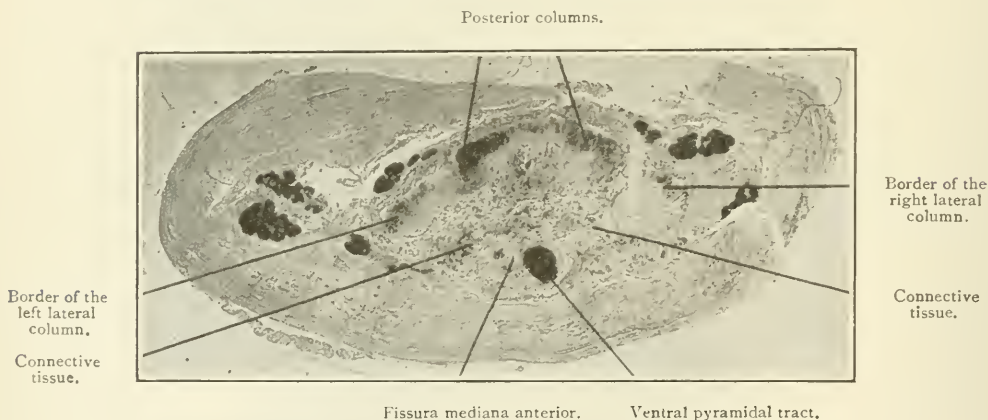


FIG. 3. Section, caudally of the greatest lesion. Weigert-Pal's stain.

In Fig. 3, the place of the normal cord is still for the greater part occupied by connective tissue, glia and degenerated nerve fibers. The posterior columns already contain more myelinic nerve fibers, the border of the left lateral column contains only a few of them (having a more ventral position than in the sections of greatest lesion) and the right one still less. The small round tract which we found running intact throughout the place of lesion is distinctly visible, stained dark by Weigert-Pal's method; it will henceforth be called the ventral pyramidal tract. I shall afterwards discuss whether this assumption is correct. A few medullated fibers appear in the anterior column on the other side.

In Fig. 4, the form of the medulla is nearly restored, the posterior columns are stained dark by Weigert-Pal's method, but for some lighter spots, probably containing (short) descending fibers. Of the

remaining part of the cord, only the right ventral pyramidal tract is normal, the lateral columns contain only the few myelinic fibers,

Posterior columns.

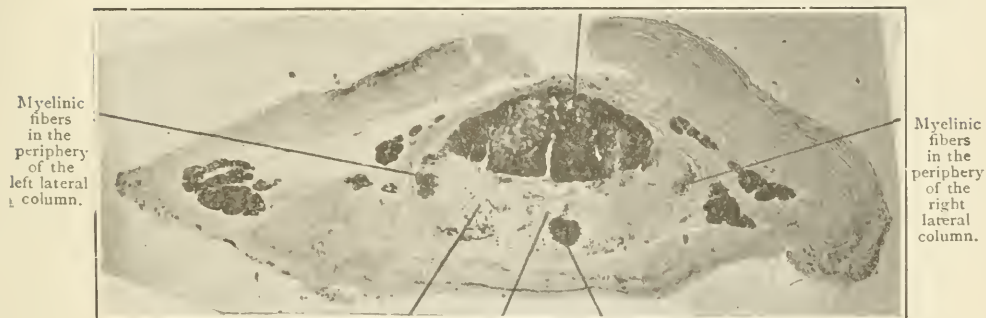


FIG. 4. Section, caudally of Fig. 3. Descending degeneration. Intact ventral pyramidal tract. Weigert-Pal.

mentioned above, the left anterior column still less. The grey figure is not yet restored, in van Gieson sections of this level, not a single ganglion cell can be detected. The whole spinal cord is much too small and remains so until the lumbo-sacral enlargement.

Small field of degeneration in posterior columns.

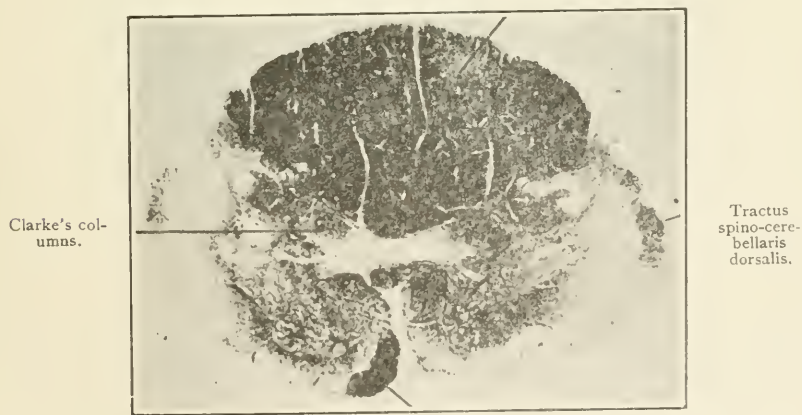


FIG. 5. Section of about the first lumbar segment or the last thoracic segment. Weigert-Pal.

Fig. 5 reproduces a section of about the last thoracic or the first lumbar segment. The spinal cord is still too small, but its structure

is normal again. With the exception of a slight degeneration in their left half, the posterior columns are also normal.

The figure of grey substance is well visible again, the ganglion cells of the horns and of the small columns of Clarke have the usual form, number and tincture. The figure shows the intact direct pyramidal tract clearly. The fundamental tracts round the anterior horns begin to be restored. The rest of the cord is degenerated, with the exception of the above-mentioned medullated nerve-fibers at the border. Also in van Gieson's preparations, no axis-cylinders are visible in the lateral columns of the cord, except for these peripheral fibers. The fibers correspond with the position of the tractus spino-

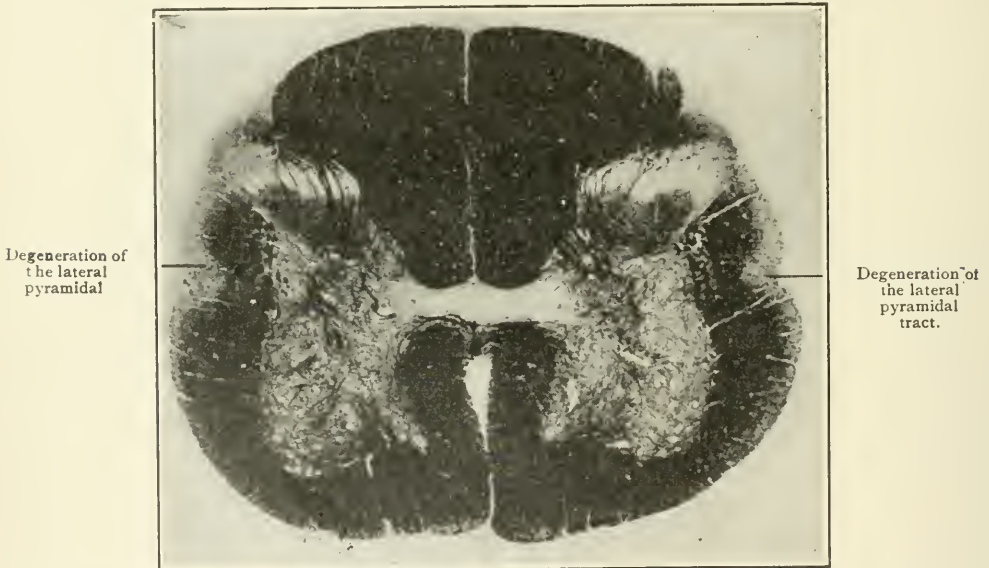


FIG. 6. Sacral segment. Degeneration of the lateral pyramidal tracts. Weigert-Pal.

cerebellaris dorsalis (Flechsig), directly lateral of the pyramidal tracts. We may therefore state that the lateral pyramidal tracts themselves have been completely abolished.

The aspect soon changes, when we come to the lumbo-sacral enlargement. Tracing the descending degeneration in a caudal direction, I found the intact right ventral pyramidal tract still present in the upper lumbar segments. Its corresponding part of the left anterior column, however, is no longer completely degenerated but already contains many medullated fibers. In many sections, one gets

the impression that the fibers of the ventral pyramidal tract run partly along the ventral median fissure to the commissura anterior, partly reach the anterior horn of the same side in a direct way. I found it impossible, however, to trace the fibers of the right ventral pyramidal tract as far as their termination with any certainty. Suffice it to state, that in the lower lumbar segments the difference between the two anterior columns has ceased to exist and that in the whole section only a very small field of degeneration is found at the ventral periphery of the cord on both sides, exactly lateral of the above-described ventral pyramidal tract, except, of course, for the degeneration of the direct pyramidal tracts in the lateral columns.

The sacral segments no longer show any abnormalities (Fig. 6) but for this degeneration of the lateral pyramidal tracts, which has now reached the border of the cord. It is a remarkable fact, which I shall have to discuss afterwards, that the degeneration of the ventral pyramidal tract ends already in the middle of the lumbar segments, whereas the degeneration of the lateral tracts can be traced up to the lowest sacral segments, where they are gradually lost sight of. The rest of the sacral segments and the filum terminale do not offer any peculiarities.

Ascending Degeneration.—Now, examining the ascending degeneration from the section of Fig. 1 onwards, we may note first of all that the leptomeninges remain hypertrophic over a considerable distance. The pia is equally hypertrophied on all sides, the arachnoidea chiefly over its dorsal half, where it lies as a thick semi-circle of connective tissue against the dura mater. Of the cord itself, the central parts are the first to be restored, but the peripheral parts, especially those surrounding the anterior root fibers, remain replaced by connective tissue over a much greater distance. First of all, the central canal reappears, which soon again assumes the usual form, with its lining membrane of ependyma—it is clear that it was only secondarily affected at the level of the greatest lesion, there is no sign of a former hematoma in or around the central canal.

The first ganglion cells (totally absent in the sections of greatest lesion) which can be recognized are those of Clarke's columns—afterwards, in more oral sections, also those of the anterior horns.

In the section of Fig. 7, the ganglion cells are still totally absent. The hypertrophy of the meninges is clearly visible, like the quite normal central canal. The right ventral pyramidal tract, though faintly visible in the photograph, is very distinct in the slides; it is the only tract not affected by the lesion.

In Fig. 8, the same section is reproduced, greatly magnified, in

order to demonstrate the tract in question better. At the left border of the cord, the strand of nervous tissue already mentioned (Fig. 1),



Ventral pyramidal tract.

FIG. 7. Section orally to the segment of lesion. See the connective tissue round the root-fibers; the ventral pyramidal tract; the intact central canal. Van Gieson stain. Paraffin preparation.

can easily be recognized, it is more or less separated from the rest of the medulla by a strand of connective tissue; some intact nerve

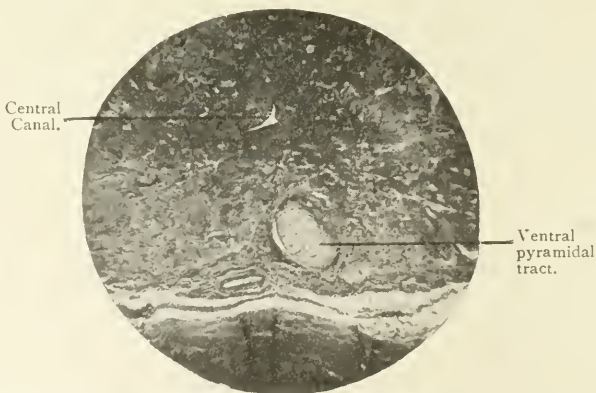
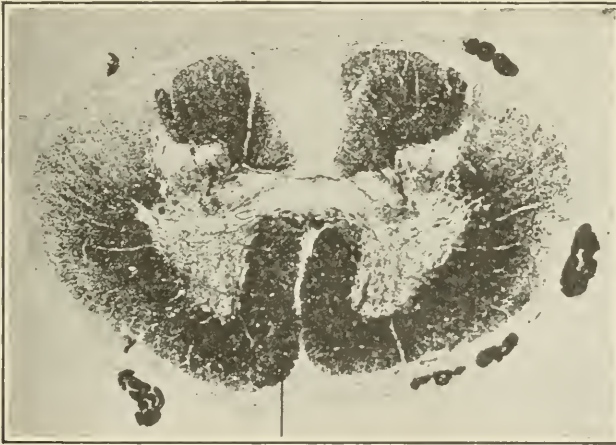


FIG. 8. Part of the section of Fig. 7, greatly magnified. See the ventral pyramidal tract and the central canal. Van Gieson stain.

fibers are visible in it. They are still less numerous than in the section of Fig. 1, consequently part of those fibers (mentioned on page

4) are ascending fibers, belonging perhaps to the direct cerebellar tract, they are partly short intramedullary fibers, for some of them have disappeared in more oral sections. At the right border of the cord, only a very few scattered medullated nerve fibers are present.

The medulla spinalis as a whole remains too small up to the cervical swelling. Examining the serial sections in an oral direction, we see the anterior columns and the inner part of the lateral column gradually grow normal again; the columns of Burdach, directly adjacent to the posterior horns, though less intensively stained than normally in the first segments following the segment of the lesion, yet attain their normal size and tincture rather soon; they include the wedge-shaped field of degeneration, corresponding to the columns of Goll.



Ventral pyramidal tract.

FIG. 9. Section of the lower thoracic segments. Degeneration of Goll's columns and of the periphery of the lateral columns. Weigert-Pal.

In the lateral columns we find a degeneration of the peripheral parts, which is broadest near the posterior horns and ends in a point at about the anterior root-fibers. Whereas the degeneration of Goll's column is very sharply outlined, the degeneration of the ascending tracts of the lateral columns is rather diffuse (Fig. 9). Briefly we may say that the sections of this level present the usual appearance of an ascending degeneration after complete transverse lesion of the cord. But I want to draw attention to the often mentioned direct pyramidal tract. The examination of the serial sections in the oral direction, too, clearly shows that we have to deal with a really long

tract; as long as the anterior columns are not completely restored and we still note a degeneration of some short intraspinal tracts or fibers, we may recognize that small circumscribed tract near the ventral part of the antero-median fissure. In Fig. 9 it is still visible, and it is even more distinct in other sections of that level. When all evidence of degeneration of the surrounding parts has disappeared, it can of course no longer be traced.

Now, discussing the further ascending degeneration from this level onward, I can be brief about the spino-cerebellar and the spino-thalamic tracts. The upper thoracic part of the cord and the greater part of the cervical cord were not taken out, so I could only trace the degeneration again in the upper cervical segments; of the latter, the oblongata, the pons and the cerebellum, I made serial sections.

In the upper cervical segments, a slight degeneration of both tractus spino-cerebellares dorsalis (Flechsig) and ventralis (Gowers) can be observed, as a less darkly stained strand along the lateral border of the oblongata—this field of degeneration does not quite reach the outline of the bulb, an intact part of the dorsal spino-cerebellar tract is situated laterally of the degenerated part, as if the fibers, originating from the cells of Clarke orally of the lesion, had laid themselves outside the fibers of the lower part of the cord (in the same way as we have observed of the posterior columns). On the level of the decussation of the pyramids, a lighter spot is still visible in the lateral part of the bulb, but at this level its interpretation has become more difficult, for which reason it is indicated in Fig. 10 in the general way of "ascending degeneration of the lateral column."

Still more orally, it is no longer possible to trace the degeneration with any certainty, there is decidedly no distinct degeneration of any part of the corpus restiforme, nor can the degeneration of the ventral spino-cerebellar tract be traced higher up in the bulb. It is still more difficult to trace the degeneration of the tractus spino-thalamic (Edinger). All certainty about it ceases to exist even in the lowest section through the medulla oblongata; in the upper cervical segments, its degeneration could be recognized medially of the spino-cerebellar tracts. It is an often discussed question whether there are in this tract, on its way to the thalamus, cells intercalated on the level of medulla oblongata. The problem, however, cannot be solved by tracing the degenerations in Weigert preparations; it is necessary to stain after Marchi. Weigert-Pal preparations only permit the tracing of well-defined compactly-degenerated tracts; therefore this

case is not suitable for a study of the degeneration of the spino-cerebellar and the spino-thalamic tracts to their termination.

Degeneration of the Posterior Columns and the Gracile Nuclei.—With the posterior columns, it is different. A sharply circumscribed degeneration of their medial part can be seen in the upper cervical segments. It is a striking fact, that the field of degeneration occupies only a very small part of the posterior columns, much smaller than is the case with a similar degeneration in an adult (see, f. i., Brouwer, 1915). It has the form of the upper piece of a bottle, the "neck" of which stretches along the postero-median septum and oc-

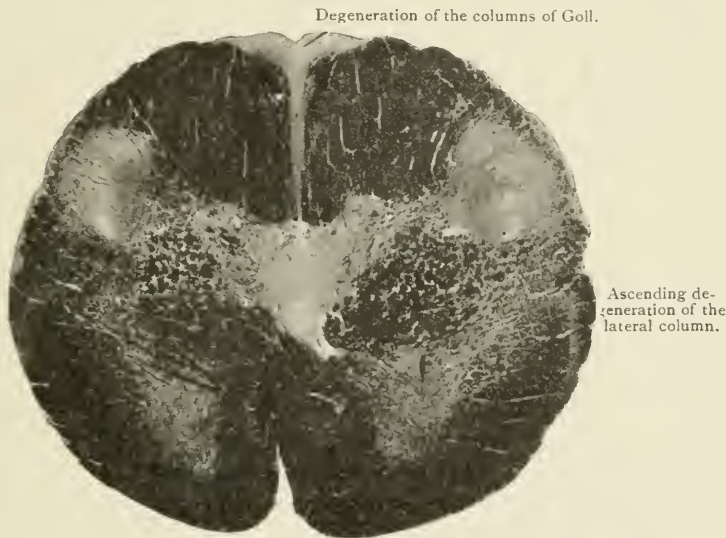


FIG. 10. Degeneration of the columns of Goll at the caudal end of the nuclei gracilis. Weigert-Pal.

cupies about three quarters of its length. Only the lateral part of this field of degeneration contains some medullated fibers, as the fibers of adjacent segments are slightly mixed in the posterior columns (Schaffer, 1898). Just caudal to the beginning of the gracile nuclei, the field of degeneration is prolonged ventralwards to the central grey matter (Fig. 10).

The nucleus gracilis itself is nearly totally degenerated. It is also much smaller than normally, especially over its caudal half, just as the degenerated part of the posterior columns was found much smaller than is normally the case.

In our case these parts of the central nervous system had never functioned and therefore they failed to develop; in the same way,

the spinal cord between the sacro-lumbar and the cervical enlargements had remained much too small, as this part of the cord chiefly consists of long tracts, and as it is these long tracts that have not functioned for the greater part. The lumbo-sacral part of the cord, however, especially the sacral part, is remarkably well-developed; it is chiefly a reflex region, consisting of grey matter and short tracts.

I return once more to the gracile nuclei. When we have passed the caudal ends, we soon find a few groups of normal cells lateral of the degenerated part of the nuclei. The difference between the cells in the degenerated part and in the intact one is very striking in van Gieson preparations: in the degenerated part the cells are smaller and situated closer together, the number of glia cells is much greater; whereas the color of the degenerated part is brownish, the intact part is stained darker, with a redder tincture. Also in Weigert preparations, it is clear that only the most lateral parts of the gracile nuclei are stained normally. More orally, this aspect changes only little. The medial and, still higher, the dorso-medial part of the nucleus, remain degenerated, and it is by far the greater part (see Figs. 11 and 12). More orally, the nucleus of Goll takes a more dorsal position, bending round the dorso-medial surface of the bulb. Though the nucleus is less distinctly separable from the surrounding nuclei, it is clear, that also at the frontal top, the greater (medio-dorsal) part is degenerated.

We see, therefore, and this is a confirmation of Brouwer's results, that the lowest spinal segments are represented in the nucleus of Goll most medially, just as in the posterior columns; in this way they spread over the whole nucleus, though perhaps a little more in the caudal half than in the oral one.

It is also remarkable, that the remaining intact thoracic segments have such a small projection on the gracile nuclei; it is quite in keeping with the fact that they cover only a small portion of the columns of Goll (Winkler, 1918, l. c., p. 195);² evidently the posterior columns and their nuclei are chiefly provided with fibers by the spinal intumescuntiae (extremities).

The further examination of the medulla oblongata, the pons-region and the cerebellum does not show any peculiarity. The lemniscus medialis is quite normal; the inferior olive, carefully examined in serial sections, has the usual size, form and histological features. Many hypotheses about the function of the olivary com-

² It is a well-known fact that the columns of Goll receive their fibers from the sacro-lumbar posterior roots and from the greater part of the dorsal roots (van Gehuchten, 1906; Edinger, 1911; Winkler, 1918).

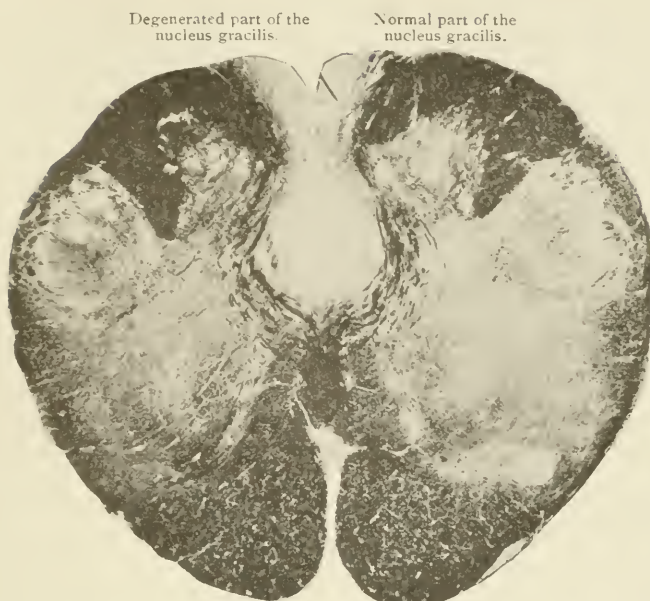


FIG. 11. Degeneration of the nuclei of Goll (caudal half). Weigert-Pal.

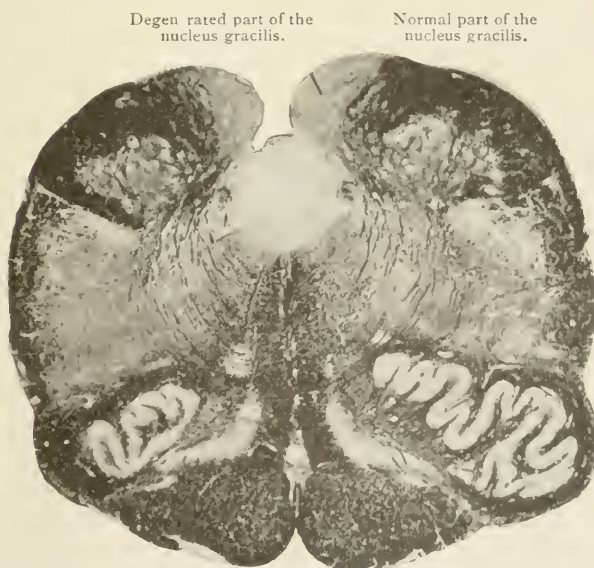


FIG. 12. Degeneration of the medial part of the nucleus of Goll.
Weigert-Pal.

plex have been published, none of them, however, based on facts. It is often supposed, that the enormous development of the principal olive in man partly depends on the erect gait; as the child in question had never been able to walk or to stand, as the olive had always been deprived of the eventual sensible stimuli from the lower extremities, its form or size might possibly have been altered in some way—though I did not think it probable. This, however, is not the case. The cerebellum did not offer any abnormalities, neither macroscopically nor microscopically.

I shall now discuss some questions in connection with the clinical data and the descending degeneration.

Classification of Lesions of the Spinal Cord, Dependent on Dystocia.—I consider the present case an example of an almost complete rupture of the spinal cord at about the level of the tenth dorsal segment.

Lesions of the spinal cord dependent on dystocia may generally occur in three different ways:

1. By *venous engorgement*. In some children, born asphyctic, who died soon after birth, scattered hemorrhages were found in the central nervous system. These cases can be compared with hematomyelia in the adult in states of sudden venous congestion, such as vigorous movements, coitus, defecation, convulsions, etc. (Gowers. 1886, l. c., p. 282; Lewandowsky, 1911, l. c., p. 559; Oppenheim, 1913, l. c., p. 459; Lépine, 1900, l. c., p. 39).

Intracranial hemorrhages in new-born infants are not uncommon, intraspinal meningeal hemorrhages, though less universally known, have already been mentioned by Cruveilhier, Friedleben (1855). Jacquet (1873) was the first to describe hemorrhages in the cord itself, dependent on dystocia.³

The cases published, in which venous congestion is probably the only cause of these hemorrhages in the spinal cord of the newborn, are not many (Couvelaire, 1903; Jacquet, 1873; Schaffer, 1897; Pfeiffer, 1896; Schultze, 1895, 1896, probably also the case of d'Herbécourt, 1898);⁴ sometimes a single focus is found, but more often there are scattered hemorrhages, a fact which is easily understood, seeing that we often find minute extravasations in several organs after asphyxial diseases. It is therefore quite evident that at the same time all causes of asphyxia may bring about hematomyelia.

³ Already in 1870, Parrot communicated a case of rupture of the spinal cord caused by powerful extraction.

⁴ In this case, however, also vascular alterations were found.

Consequently it is impossible to state what sort of birth mechanism is apt to cause this form of medullary lesion intra or post partum. As regards prevention of therapeutics, nothing can be said. However, it appears that Schultze's swingings of the asphyctic child are particularly dangerous in this respect (Knapp, quoted after Oppenheim, 1913, l. c., p. 460).

2. The second way, in which the spinal cord may be affected in dystocia, is by a *fracture, rupture or luxation of the vertebral column* and a secondary meningeal and medullary hemorrhage or a more or less complete compression of the cord. Of this medullary lesion, the etiology, the pathological anatomy and the clinical symptoms are of course the same as those of fracture of the spine in the adult.

There are many casuistic communications about fracture of the vertebral column durante partu, for it is not an infrequent occurrence; Ruge found a vertebral rupture in 8 out of 64 autopsies of newborn children, Stoltzenberg (1911) in 9 out of 75 autopsies. According to Ruge and Küstner (quoted after Hofbauer), it is always the vertebral body⁵ itself that has been ruptured along the epiphyseal line, not the ligaments. According to Stoltzenberg, however, the mechanism of rupture in her own cases was the following: first of all, the lateral capsular ligaments were torn, then followed the adjacent part of the ligaments of the neural arch (which are very tender in the newborn), finally the cartilaginous part of the vertebræ themselves. The author could confirm this conception by experiments; by exercising on the bodies of newborn children a traction of a certain power. She obtained the same kind of rupture, the extent of which was proportional to the degree of deviation from the longitudinal axis (in a lateral direction), not to the power of traction. It is evident that especially cases of the aftercoming head with difficult development of the arms and shoulders, cause the spinal lesion in question, for in these cases traction at the column is combined with deviation from the longitudinal axis, and it is also easily understood that it is especially the cervical column that is most apt to undergo rupture, for the angle between the axis of traction and the child's longitudinal axis is situated there. Also, in all nine cases of Stoltzenberg, the lesion was found in the cervical column; the same was observed by Birnbaum (1906) and Hofbauer (1907). Moreover, the cervical column of the newborn seems, according to the experiments of Duncan (1874), the most fragile part of the whole vertebral column, also when the axis of traction coincides with the child's longitudinal axis.

Though the lesion of the vertebral column in dystocia has often been described, cases with a subsequent destruction of the cord are

⁵ According to Hofbauer (1907) it is the sixth cervical vertebra which is most frequently fractured.

rarely mentioned, most authors mention only intraspinal meningeal hemorrhages.

3. A third group is formed by the cases of a *partial or complete rupture of the cord*, while the vertebral column is quite intact. In the adult we also know those cases, in which a traumatic lesion of the cord comes about without any alteration of the vertebral column (see, f. i., Watts, 1897), but they are not analogous to our cases, in which there is no question of a direct trauma; moreover in those cases of traumatic lesion of the cord (in the adult) without affection of the spine, the cord is seldom ruptured, usually only a hemorrhage is found.

The present group can be compared best with those cases in which a traction at the nerve roots had taken place (f. i., by stretching the sciatic nerve in sufferers from tabes dorsalis or ischias (Rumpf, 1884; Petré, 1909), or by reposition of a hipjoint-luxation (Schlesinger, 1899), or with those cases in which the vertebral column is bent acutely and extremely (Thorburn, 1887; Oppenheim, 1913).⁶

It is only in order to make the several factors clearer, which play a part in the case of lesions of the spinal cord *durante partu*, that I have made this schematic classification. Of course these factors are often (probably as a rule) combined.⁷

It is also often impossible, afterwards, to decide by macro- or microscopical examination of the lesion, what the precise mechanism of its origin was. Most difficult of all is the differentiation of hematomyelia from rupture, as a rupture of the cord is of course always combined with hemorrhage and as a large hemorrhage may cause a complete destruction of the spinal cord. Especially in older cases, the difficulty is great; if the vertebral column had been only temporarily dislocated (a possibility which is also known in the adult), we may afterwards find no sign of its former lesion. The hematoma has disappeared and the differentiation between rupture and hematomyelia on the remaining cicatrice may have become quite impossible. In the present case, however, the diagnosis "rupture of the cord" can be made with certainty. Not only because the vertebral column was found totally intact, but also on account of the aspect of the cicatrice. The cord was found replaced by connective tissue over a considerable distance (except for small strands of nervous

⁶ It is true that also in those cases a rupture is not described, as far as I know; they only deal with hematomyelia, but then the manipulations to which the new-born are subject are much stronger.

⁷ Déjérine has pointed out that rupture of the spinal nerve roots can be combined with hematomyelia (quoted after Oppenheim, 1913, I, l. c., p. 460).

tissue); the central grey matter and the central canal were the first to be found normal again (in the examination of serial sections), whereas in the cases of primary hematomyelia it is just the grey substance, that is most injured. In this case the greatest destruction and the most striking development of connective tissue was found about the root fibers entering and leaving the cord, as if the traction had in the first place occurred at the nerve roots. I am therefore inclined to consider the present case as one of rupture.

It is a matter of course that also of this third group of medullary lesions the difficult delivery of the aftercoming head is the most frequent cause; also the cases of Parrot (1870), Handwerck (1901), Gött (1909), Lawatschek (1911), all more or less analogous to our case, concerned difficult extractions by the feet.

In our case, the application of the method of Müller (1898) may have been favorable for causing the lesion, as the vertebral column is bent extremely in a lateral direction by this manipulation.

Finally I intend to discuss three clinical questions, viz., that of the reflexes, of the bed sore and of the paralysis.

According to the law of Bastian (1890), in the case of complete transverse section of the spinal cord the tendon-reflexes are absolutely absent in the part of the body below the lesion. This law has been much discussed, it is accepted, f. i., by Dejerine (1911, '12, '15), while on the other hand Lewandowsky (1911), Oppenheim (1913, von Monakow (1905) do not believe it to be of general value.

Kausch's (1901) case has indeed convinced me that—though Bastian's rule may usually be confirmed, complete section of the cord need not include an abolition of the tendon reflexes with absolute certainty.⁸

Brouwer (1915) described a case of complete transverse section of the cord of traumatic origin, in which the knee and ankle-jerks were first absent, but reappeared and even became exaggerated a year later, to disappear once more some years afterwards. He attributes the latter fact to the bad conditions of the peripheral parts (muscles, tendons, etc.), a hypothesis already expressed before him by Gerhardt⁹ (1895) and Kausch (1901), and warns against the making of conclusions from cases with short survival of the trauma. Yet in other cases the reflexes may remain absent for life-time, even

⁸ The only objection to Kausch's case is that it concerns a man whose spinal cord had already been compressed for three years; the lower part of the cord, containing the reflex arc for knee- and ankle-jerks, might have become more or less independent before the complete transverse section took place.

⁹ For the rest, Gerhardt's case does not speak at all against Bastian's law. See the critique of Bruns (1895).

for a much longer time than in Brouwer's case (Lewandowsky (1910), l. c., p. 597). Of course the present case does not give absolute proof; for those fundamental questions a complete section of the cord is necessary. Still it is remarkable, that the knee-jerks, and still more the ankle-jerks, which have their medullary center in a segment (S_1-S_2) that had apparently not the slightest connection with the further central nervous system (total loss of all kinds of sensibility, total paralysis), were repeatedly found present and even exaggerated, whereas they gradually disappeared in the later period of life. Babinski's reflex, found present in 1912 and 1914, had in the same way disappeared in 1917 and 1918. As is well-known, this reflex usually coincides with the exaggeration of the tendon reflexes, whereas it is a rule (though not always, see f. i., the case of Brouwer) absent in the cases of complete transverse section (Déjérine, 1915). So our case is quite analogous to that of Brouwer, but for the reflex of Babinski.

That the reflexes disappeared once more, must be attributed to the bad condition of the peripheral parts (vide supra; see also the electric changes, mentioned on page 3).

Decubitus Acutus.—The direct cause of *acute bedsores* is still an open question. Samuel (1860) and Charcot (1884) considered it to be a trophic abnormality, later authors (Leyden-Goldscheider (1895), von Monakow (1905), are most inclined to see the cause of it in several other reasons: the permanent pressure of the integuments on account of the insensibility and paralysis, combined with defilement by the excrements, with infection and with vasomotor abnormalities.

Oppenheim (1913, l. c., p. 144), Cassirer (1912, l. c., p. 123), though believing that the above-mentioned factors can usually explain the acute decubitus, dare not exclude the possibility of trophic influences. Of course the problem cannot be solved from the present case. Yet it is worth while to dwell for a moment upon the fact, that in this new-born infant, decubitus appeared already in the first days after birth. The insensibility, the paralysis, the incontinentia cannot explain it in this case, for in this respect, the child did not differ from other babies, who also do not move themselves, but are turned about every three or four hours.

The child was carefully nursed from the beginning; in such a young baby, the pressure on the sacrum could only have been very slight—moreover, the child (it was especially noted in this case) was rather fat.

Are not these considerations in favor of the supposition of the

existence of trophic influences, since vasomotor abnormalities alone are known not to be sufficient to explain the decubitus?¹⁰

Function of the Ventral Pyramidal Tracts.—Finally I intend to discuss a certain point in connection with the intact ventral pyramidal tract. In the preceding pages (see also Figs. 1-9) I have described, that a small tract was left intact by the lesion of the spinal cord; by tracing it in serial sections in an oral and especially in a caudal direction, it could be ascertained, that it was for the greater part a long descending tract (perhaps also containing some short fibers). On account of its position along the ventral median fissure, this intact tract must be the ventral part of so-called direct pyramidal tract. Here I must remind the reader of the fact that the child had been able to flex both legs in the hip-joint, as was stated by the mother and several physicians. As the lesion of the cord occupied the ninth and tenth thoracic segment, the centers for the acting muscles were below the lesion, and so the tract in question is the only one, which could conduct motor impulses from the cerebrum to the moving legs. In this case the fibers of the right ventral pyramidal tracts must have reached the anterior horn of *both* sides—for the child had moved both legs during the first years of its life.

The way in which the ventral pyramidal tract ends is a well-known point of discussion.

According to van Gehuchten (l. c., p. 920) most authors believe that the fibers of this tract reach the anterior horn of the other side by the commissura anterior. Edinger (1911, l. c., p. 147) is of the same opinion. Lewandowsky (1905), on the contrary, believes the ventral pyramidal tract to be a really direct tract, of which the fibers end in the anterior horn of the same side.

Winkler (1918), also basing on observations made by Marie, supposed that the lateral and the ventral pyramidal tracts have different functions. There are various arguments in favor of this hypothesis. In cases of a hemiplegic contracture, there is often also a slight paresis of the other (not paralyzed) leg; not all the fibers of the ventral pyramidal tract reach the anterior horn of the other side, tracing its degeneration in slides, stained after Marche, the ventral pyramidal tract keeps the same size throughout the spinal cord, until the lumbo-sacral swelling, where it rapidly disappears. The thought arises, whether the ventral pyramidal tract might possibly serve as a path for bilateral innervations of the legs; this supposition would be in perfect accordance with the well-known fact that the lower ex-

¹⁰ See for a critique of the various vasomotor theories the excellent monograph of Cassirer, especially p. 56.

trémities show many common movements, whereas the upper extremities (with their unilateral innervation by the lateral pyramidal tract) are much more independent of each other.

It seems to me that the present case, in which both legs could move, and in which at the same time only the right ventral pyramidal tract comes into consideration for the conduction of the necessary stimuli from the cerebrum to the lumbar intumescencia, favors this hypothesis.

RÉSUMÉ

In this paper a case has been described of nearly complete rupture of the cord at the level of the ninth and tenth thoracic segment. The child was born by version and extraction, the shoulders were delivered by the method of Müller—from her birth until her death, about nine years afterwards—the little patient suffered from paraplegia (except for the flexion of the legs in the hip-joint), from total or almost total loss of sensibility of the legs, from incontinentia alvi et urinæ and from decubitus in the sacral region. The case demonstrates the danger which is always inherent to strong traction during delivery. (The method of Müller, by which a deviation of the traction axis from the longitudinal axis of the child is brought about, may be considered especially dangerous in this respect.)

From the microscopical examination it appears that the ventral pyramidal tract is the only long tract left intact by the lesion. It is supposed that this tract conducts motor stimuli to the anterior horns of the lumbar swelling on both sides, as the child could flex both legs. Though there was an almost complete destruction of the cord, the tendon reflexes were increased in the first period of life, whereas they disappeared in later years. Though the case cannot supply us with absolute proof, this condition is not in favor of Bastian's law. The acute decubitus in this case of rupture of the cord in a newborn infant is in accordance with the assumption of the existence of trophic influences of the central nervous system on the integuments.

From the examination of the ascending degeneration it appears that the lumbo-sacral segments occupy by far the greater part of the columns and the nuclei of Goll; the fibers of these lower segments end in the medial and medio-dorsal part of the gracile nuclei over their total length.

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FACIAL PONTINE DIPLEGIA (TRAUMATIC)

BY G. B. HASSIN, M.D.

ATTENDING NEUROLOGIST AT THE COOK COUNTY HOSPITAL, CHICAGO

DAVID M. LEVY, M.D., AND W. E. TUPPER, M.D.

CHICAGO

Bilateral paralysis of the facial nerve may, like the unilateral, be of the central or peripheral type. The central paralysis signifies a cortical, subcortical or nuclear lesion; a peripheral paralysis indicates a lesion of the nerve trunk along its course, *i.e.*, after it leaves the nucleus. In central facial paralysis of one or both sides, the upper portion is more or less spared, while in peripheral paralysis all the branches are involved, the paralysis being total. Contrary to the unilateral total facial paralysis, generally known as Bell's palsy, the bilateral type is an exceedingly rare occurrence. It may be in-born, or form a part of the clinical picture of polyneuritis, syphilis or tumor of the brain, of a basilar meningitis, and finally of head injuries.

As the facial nerve pursues a complicated course through the pons, Fallopiian canal and the face, after emerging from the stylo-mastoid foramen, it is obvious that a bilateral lesion of any of the foregoing regions may result in a double total paralysis of this nerve in facial diplegia. Thus, injuries to both sides of the face, after application of forceps, for instance,¹ lesions of the Fallopiian canal, of the pons (tumors, hemorrhages or other vascular disorders) may result in a facial diplegia. Of the foregoing causes, the traumatic are the most uncommon, *the rarest*. Even the *war* literature, according to Marchand,² so far has not furnished many cases. Of these he reports one. To this may be added the cases of Romberg,³ Hubbell,⁴ Edgeworth,¹ Oppenheim and Hallez,⁵ and Ransohoff⁶ who

¹ Edgeworth, E. F., Case of bilateral facial paralysis due to injury by forceps at birth, *Brit. M. J.*, 1894, p. 11 (January 6).

² Marchand, *Progrès Méd.*, XX, 120, 1918.

³ Romberg, M. H., *Lehrbuch der Nervenkrankheiten des Menschen*, 1857, pp. 764 und 773, Berlin.

⁴ Hubbell, Case of both facial and both abducens paralysis following injury, *Buffalo Med. and Surg. Journal*, 29, 94, 1889.

⁵ Oppenheim, R., and Hallez, G. L., *La Diplégie faciale traumatique*, *Paris Médical*, VII, 136, 1917, August 11.

⁶ Ransohoff, J., Traumatic facial diplegia, *Annals of Surgery*, 70: 150, 1919.

also briefly refers to a case of E. Sachs, and one to be recorded by ourselves.

History of Case.—A colored soldier, 24 years old, on June 9, 1919, had his head injured between two railroad cars. He was un-



FIG. 1. Facial diplegia with paralysis of the left abducens. The patient tried to look to the left: the right eye is turned inwards, the left—immobile. The left side of face appears more paralyzed.

conscious for three weeks. Two and one half months after the accident, August 23, 1919, he entered the Cook County Hospital's neurologic service.

Examination.—Excellent physical and mental condition; no Rom-

berg, no abnormalities in gait, in the muscular, bony or genito-urinary systems. He did not complain of headache, dizziness or gastro-intestinal disturbances, in fact the subjective examination was negative, except the extreme dryness of the tongue and inability to pronounce labials (b, p, m). The face was expressionless, mimical movements like laughing, smiling, etc.; were impossible; both naso-labial folds were obliterated, the corners of the mouth and the lower lip were hanging down, especially the left; he could not wrinkle forehead, pucker his lips, close his eyes, show the teeth. In drinking or smoking he had to roll up and support the lower lip. The tongue was very dry, slightly corrugated, but could be protruded and moved in every direction. The uvula, soft palate, showed no abnormalities; the right eye could move in every direction, while the left showed a marked paralysis of the external movements (Fig. 1), but in-, up- and downward movements were normal. There was no nystagmus even upon extensive movements of the eyes.

The taste for sour, sweet and salt was lost, mostly over the anterior two thirds of tongue, while bitter was absent all over the tongue. The sensibility of the face, tongue, like that over the rest of the body, was normal. The tendon, skin and mucous reflexes, except the conjunctival and corneal, were normal.

The electrical examination (the galvanic current only was available) showed a complete reaction of degeneration of both facial nerves and of the muscles supplied by them.

The Roentgen examination (Dr. Blaine) revealed "a shadow indicating a fracture extending into the middle fossa of the skull close to the base and involving the right parieto-temporal region."

Ear Examination, performed September 22, 1919, in the ear service of Cook County Hospital: "Granulations present on the roof of the canal of the left auditory meatus about mid-way, probably resulting from a fracture. There is no drum perforation. In the right ear an exostosis dividing the canal in two parts."

Nystagmus Test.—Rotation to the right produced no nystagmus, to the left a nystagmus to the right that lasted six seconds (normally about 25 seconds). No past-pointing either stationary or after rotation to the left; but after rotation to the right there was a momentary past-pointing to the right (two inches), with both hands. Hearing fairly good."

Conclusions.—"Vestibular apparatus badly damaged; the lesion is probably central and not due to fracture through the labyrinth."

Two more examinations of the vestibular apparatus were made (October 9 and 13) for the express purpose of determining a pos-

sible pons lesion by alternate irrigations of the vertical and horizontal canals, as advocated by Lewis Fischer.⁷

October 9, 1919: Douching of the right ear (cold water) gave no nystagmus, no past-pointing, no vertigo from either vertical or horizontal canals; douching of the left ear elicited no response from the vertical canals, while the horizontal canals gave a slow nystagmus to the left of 15 seconds duration, and past-pointing to the left, two inches.

October 13, 1919: Stimulation of the vertical canals by rotation gives normal, but much shortened reactions. Stimulation of the horizontal canals by rotation to the right gives nystagmus to the left, lasting about three seconds, and a momentary past-pointing to the right; rotation to the left gives a nystagmus to the right lasting about six seconds, and produces a past-pointing with the left, but not with the right hand. Hearing normal on the left ear, somewhat diminished on the right; bone conduction normal on the left, prolonged on the right. Conclusions: "the lesion of the vestibular apparatus is not due to a labyrinth destruction, is not peripheral" (Boot).

The serologic, urinary, ophthalmoscopic findings were all negative. Blood pressure 112 and 68; pulse 76; resp. 18.

Course.—The right facial nerve, especially the lower branch, showed marked and progressive improvement, but the left facial and left abducens remained stationary at the time of the last examination (October 13, 1919).

SUMMARY AND DISCUSSION

The outlined findings can be summed up as (1) a bilateral degenerative facial paralysis of peripheral type, (2) a paralysis of the left abducens, (3) involvement of chorda tympani, (4) slightly impaired hearing on the right and (5) lesion of a central portion of the vestibular apparatus. The chorda tympani involvement speaks for a lesion of both facial nerves in their Fallopian course, that is in the petrosal portion of the temporal bone. Such a localization would be very plausible and could well be explained by the fracture of the skull. But a bilateral fracture of the pyramid bones is usually fatal (Marchand), and could not very well explain the involvement of the left sixth nerve. A hemorrhage in the Fallopian canals or any other traumatism to the auditory canal could account for the slight auditory and pronounced chorda tympani disorders, but then we must admit of a separate lesion for the sixth nerve paralysis. In

⁷ Jones, I. H., and Fischer, Lewis, *Equilibrium and Vertigo*, 1918, J. B. Lippincott Co., Philadelphia and London.

other words, in this case we must look for several or multiple lesions, which are the rule in severe concussions of the brain (Jacob⁸). One of these lesions, probably the principal one, is evidently in the pons,

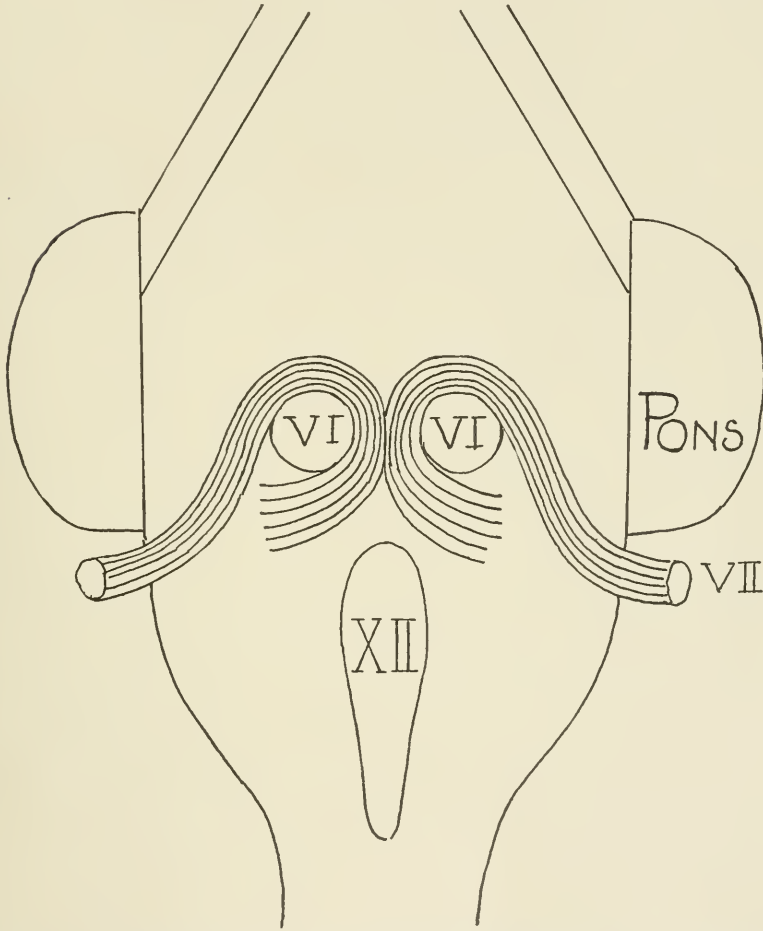


FIG. 2. Diagram of the pons and medulla oblongata. VI, VI, nuclei of the sixth nerves looped by the trunks of the seventh nerves; XII, the nucleus of the twelfth nerve. (From Obersteiner.)

its tegmental portion, which contains the sixth nuclei which are looped by the seventh nerves in their course to the periphery (Fig. 2). Assuming such a course, it would be easy to give an anatomical

⁸ Jacob, A., Experimentelle Untersuchungen über die traumatischen Schädigungen des Zentralnervensystems (mit besonderer Berücksichtigung der Commotio cerebri und Commotionsneurose), Nissl-Alzheimer's Arbeiten, V, 182, 1912.

explanation for the combined seventh and sixth nerve involvement, as well as for that of the adjacent structures (the longitudinal bundle, acustico-pontine fibers, contralateral seventh nerve) and of the vestibular test findings. Any other focus, a hemorrhage, for instance, on the base of the brain, around the sixth nerves, would give a crossed hemiplegia which in our patient was absent. Hubbell's case, which is almost a copy of ours, was also interpreted—among others by Putnam—as a pontine lesion.

In the absence of a post-mortem it is, of course, impossible to be absolutely definite as to the nature (hemorrhage, laceration of brain tissue) or the exact seat of the lesion, but the anatomical considerations, the vestibular test findings decidedly speak for the facial diplegia in this case being of a pontine origin.

31 N. STATE STREET,
COOK COUNTY HOSPITAL

Current Literature

I. VEGETATIVE NEUROLOGY

2. ENDOCRINOLOGY.

Blondel, R. EXOPHTHALMIC GOITER AND STERILITY. [Bull. d. l'Acad. de Med., Oct. 14, 1919. J. A. M. A.]

The author here comments on the prevalence during the war of the emotional factors known to coöperate in the production of exophthalmic goiter, and remarks that he has not been surprised to find hyperthyroidism much more prevalent now than in former years, especially in women. Any one of the main symptoms, the exophthalmos, the tachycardia, tremor or goiter, may alone reveal the excessive functioning of the thyroid, and explain any one of numerous trophic and other changes. Chief among these he has noticed a decrease in the size of the uterus. This atrophy of the uterus is possibly the explanation of sterility in certain cases, and as such the causal hyperthyroidism should be combated. There are several ways of doing this, raying the thyroid, injecting serum from thyroidectomized animals, thymus treatment, and other means. He prefers thymus treatment, and has been using it for years as the routine treatment in exophthalmic goiter. He gives half of a raw thymus from a lamb, chopped and mixed with a little flour, salt and butter to make small balls that are mixed with soup as it is eaten. Subcutaneous injection of the extract is more active, but less convenient for the patient. Thymus treatment is logical, he reiterates, on account of the antagonism between the thymus and thyroid, and years of experience have proved the soundness of these premises. He warns in conclusion that one must be wary in giving iodine in cases of amenorrhea or mild hyperthyroidism may be exaggerated. The thymus treatment in these cases of sterility might be supplemented by massage of the uterus and dilatation with laminaria for three or four days, each month or two months. The pathologic condition does not seem to be able to right itself spontaneously but with this treatment perseveringly carried out good results were obtained in the majority of his cases.

Baer, Joseph. RELATION OF THE THYROID TO THE FEMALE SEXUAL SPHERE. [Virginia Medical Monthly, August, 1919.]

The author reviews various observations on the relationship of the thyroid to menstruation, pregnancy, and lactation. There is sufficient

clinical proof in support of the theory that what is called a normal, physiological hyper-activity of the thyroid gland is a valuable defensive agent against the toxemia of pregnancy. The conclusion is also justified that there exists such a relation between the physiology and pathology of the reproductive organs and the growth, function, and degeneration of the thyroid as to make one carefully consider the pelvic organs in all cases of impaired thyroid functions. The growing girl should receive greater attention at puberty, for the physiological disturbance of the thyroid at this time may extend into a pathological process in later years. Patients showing marked enlargement of the thyroid during pregnancy should be carefully managed. Any signs of hypothyroidism, toxemia, or eclampsia should be promptly attended to.

Norris, E. H. THE EARLY MORPHOGENESIS OF THE HUMAN THYROID GLAND. [American Journ. of Anatomy, November 15, 1918.]

The author presents a study on the early morphogenesis of the thyroid gland in the human subject in an attempt to formulate an interpretation of the processes involved in the development of the median thyroid. For descriptive purposes the morphogenesis of the thyroid gland is divisible into eight stages. (1) Pre-*Anlage* stage. This represents that period in embryonal development between the time of the formation of the entodermal pharynx and the appearance of the thyroid *Anlage*. (2) Early *Anlage* stage. The *Anlage* is first recognizable as an evagination of the mesobranchial region of the pharyngeal floor between the ventral extremities of the first two pairs of gill pouches. The cavity of this diverticulum is encroached upon by a localized thickening of the epithelium in its floor. (3) Early growth stage. This is represented by three types, owing their differences in form to various distributions of the growth activity of the *Anlage*. (a) The first presents the form of a solid pyriform globose bud suspended from the floor of the pharynx by a short, solid neck. In type (b) the suspending stalk is hollow and tube-like. Type (c) shows a clearly bi-lobed bud, each lobe being suspended by a short, hollow stalk. (4) Beginning separation stage. In this, as in the preceding stage, there are three types, each produced by a lengthening of the suspending stalk of the three previous types. (5) Complete separation stage. The earliest instance of this is in an embryo of 3.9 mm. length, while the oldest embryo showing the gland still attached to the pharyngeal floor was 7 mm. in length. There is great variability in the form of the gland at the time at which its independence becomes established. The stalk may break at its proximal end (pharyngeal), at its distal end (glandular), at both ends, or it may divide midway between the pharynx and gland mass, thus accounting for variations met with in full development along the course of the "thyroglossal duct," such as the so-called lingual or thyroid rests, suprahyoid bodies, etc. (6) Cavity formation stage. In embryos of 7 mm. length there appear within the

gland mass a number of completely closed cavities with a distinct outline and no visible content. These cavities do not persist for long, but soon open to the outside and are invaded by the surrounding vascular mesenchyma. Thus is reached (7) the plate stage, when the gland is composed of smooth, two-celled epithelial plates, which anastomose freely and ultimately come to form an extremely complex structure. Other plates are formed from these by budding and growth. Apparently the upper pulse of the lateral lobes of the adult gland are formed from these secondary plates. (8) Follicular stage. The epithelial plates are gradually replaced by developing thyroid follicles, which form in the plates and are thus entirely independent of the earlier transient intraglandular cavities, which in turn are independent of the primitive lumen of the thyro-glossal duct. By presenting the morphogenesis of the thyroid gland in this way it is possible to co-relate other observations and interpret harmoniously the various descriptions afforded by the literature. With regard to stage (6) and the development of intraglandular cavities, if the vertebrate thyroid is the phylogenetic representative of a true externally secreting gland, it might be suggested that these cavities appear in an attempt to reproduce the ancient lumen or duct of the ancestral gland. Such a theory would harmonize known anatomical and physiological facts regarding the endocrine function of the thyroid. The lumen of the thyroglossal duct does not extend into the body of the gland at any time; cavities found there must, therefore, be morphologically independent of it, although they may be phylogenetically related. [Med. Jl. Australia.]

Souques and Lermoyez, J. FAMILIAL EXOPHTHALMIC GOITER. [Rev. Neur., Vol. 26, No. 1.]

In the family described here seven cases of exophthalmic goiter among the sixteen members of the family in three generations have occurred. The inherited factor seemed to be transmitted through the males. There were no signs of inherited syphilis. They give a list of the familial cases on record. In one, eleven of sixteen had developed exophthalmic goiter.

Christie, C. D. EXOPHTHALMIC GOITER AND BASAL METABOLISM. [Ohio State Med. Jl., Nov., 1919. J. A. M. A.]

About sixty determinations of basal metabolism have been made by Christie on patients with various forms of goiter. The majority of these determinations have been on patients who have shown ample clinical evidence for a diagnosis of exophthalmic goiter. Christie has established definitely in his own mind that an increase in metabolism is a most constant symptom of exophthalmic goiter, and that the degree of this increase is a very constant quantitative measure of the severity of the disease, and that other forms of goiter do not give values which

are above normal and that there are doubtless many border line cases which, without a quantitative measurement of the metabolism, could be looked on with perfect justice as cases of exophthalmic goiter without increase in metabolism. Furthermore, Christie says, the simple portable apparatus described by Benedict is entirely feasible for the average clinic, because it is simple to manipulate, cheap and gives very accurate results.

Plummer, W. A. BLOOD IN EXOPHTHALMIC GOITER. [Minnesota Medicine, 2, 1919, No. 9.]

Plummer's findings based on an examination of the blood of 578 patients are here reported. An anemia, when present, is not the result of, nor coincident with, hyperthyroidism, but is due to secondary changes. He finds no anemia of the chlorotic type. The real status of the leukocytes is that there is a wider variation, dependent on the neutrophils, than with normal blood. Leukopenia is not more frequently present in the early stages. In the majority of patients there is a relative and absolute mononucleosis. When leukopenia is present the neutrophils are the ones involved. The eosinophils show variation, but no increase.

Delgado, H. F. HYPERTHYROIDISM AND IODIDES. [Cronica Medica, 36, 1919, No. 671.]

Excellent results from the use of potassium iodid are claimed by Delgado in certain cases of hyperthyroidism. The mechanism of its action is not clear, he states, but the fact of the efficacy of potassium iodide in his cases was beyond question. In the case reported, the enlargement of tachycardia exophthalmos and the thyroid had developed with hallucinations and distress, after a period of emotional stress and *financial worry*. Delgado used psychotherapy and gave daily 4 gm. of potassium iodid, and in two days nearly all the symptoms had disappeared.

Strandberg, J. ALOPECIA AND THYROID. [Acta Med. Skan., 1919, 52, No. 1.]

Nine cases of alopecia are here reported upon in which endocrine disturbance seemed to be responsible. Six were in men. Two of the patients had dementia præcox and one showed signs of syphilis. Thyroid was given to all. In three the hair grew again. In the dementia præcox patient the hair began to grow as the mental condition improved. One woman was not benefited by the thyroid.

Williamson, R. T. EXOPHTHALMIC GOITER AND DIABETES. [Lancet, Sept. 6, 1919. Med. Rec.]

R. T. Williamson calls attention to a number of interesting facts

which indicate the relation of Graves' disease to diabetes mellitus and glycosuria, and refers to cases met with in his practice which illustrate this relation from the clinical side. These are: 1. Graves' disease is occasionally followed by, or associated with, diabetes mellitus well marked or mild. 2. In Graves' disease frequently a temporary or intermittent slight glycosuria can be detected. 3. Mild diabetes is, in rare instances, followed by Graves' disease; such cases are extremely rare. In Graves' disease alimentary glycosuria is often produced much more readily than in health by the administration of a large quantity of sugar. 5. Both Graves' disease and diabetes mellitus occasionally develop directly after a sudden mental shock or after great mental anxiety of short or long duration. 6. Occasionally the family history shows that the two diseases have occurred in different members of the same family. Many other points of interest respecting the relation of the two diseases based on experimental work might be added. 7. In Graves' disease occasionally the patient suffers from nausea, sickness, and persistent vomiting and may be unable to take food and may very rapidly become wasted. In some of these cases there is a marked diacetic acid reaction in the urine, though the urine is free from sugar. The condition resembles the acetonemia of diabetic coma in many respects. The relationship of these conditions should be taken into consideration in the treatment. If glycosuria is frequent or permanent then a diet chiefly of carbohydrate food is unsuitable in such cases of Graves' disease. In definite diabetes, associated with or followed by Graves' disease, of course the diet suitable for the form of diabetes detected should be advised, as the diabetes is usually more serious than the Graves' disease. To this statement there is one exception, and that is in case of Graves' disease, complicated with persistent vomiting, with acetonuria, and with diacetic acid in the urine, if no glycosuria is detected sugar carbohydrates, such as tinned apricots, sweet fruit, etc., may be of much service for a short time, along with alkalies.

Sloan, H. G. RECURRENCE OF EXOPHTHALMIC GOITER AFTER THYROIDECTOMY. [Surg., Gyn., and Obst., August, 1919.]

The author calls attention to cases of recurrence of the symptoms of exophthalmic goiter after almost entire removal of the thyroid. He believes that in practically all of those that have recurrence there is an underlying factor of focal infection which has not been discovered or cleared up. In ten illustrative cases the author points out the benefit from eradication of the infected focus.

Nordentoft, S. X-RAY AND GOITER. [Ugesk. f. Laeger., 1919, 81, July 17.]

This author now reports upon one hundred patients with exophthalmic goiter treated by X-rays. Fifty of these had been previously re-

ported upon and he obtains similar results in the two series. Small roentgen doses he maintains are irritating, while a single large dose has a destructive action and is to be recommended. If there is any risk it is with repeated small doses of the X-rays. As to operative treatment, he notes the fatal outcome in fourteen of the seventy-six operative cases at the Rigshospital. He recommends the banal "change of climate" or travel for the treatment of what he calls the "nervous instability."

Secher, K. DANGERS IN X-RAY TREATMENT OF EXOPHTHALMIC GOITER. [Nord. Med. Ark., J. A. M. A., Oct. 18, 1918.]

Secher reports the case of a previously healthy woman of thirty-nine, who had developed exophthalmic goiter in the course of a year. He gave eight roentgen exposures in two days, each a one-half Sabouraud-Noiré dose, and a 2 mm. filter, exposing three fields on the thyroid gland and one on the thymus. The condition became aggravated, even during the roentgen treatment, and the condition grew rapidly worse till death the fifth day. He reviews the three cases on record in which roentgen exposures of simple goiter were followed by symptoms of exophthalmic goiter. In Rieder's and Verner's cases the aggravation proved speedily fatal, as in the case here described.

Ransom, F. THYROID AND IODIDE. [Lancet, Sept. 6, 1919. Med. Rec.]

F. Ransom discusses the relation of the thyroid gland to iodine and the rôle of protein in the cell metabolism of the gland. He states that there is considerable probability that the active principle of the thyroid is a breakdown product of protein which may be, but is not necessarily, iodized. Iodine, if present, has apparently no direct effect upon the activity of the internal secretion, and yet there is no doubt that when that activity is diminished, it can often be restored to a certain extent by the administration of iodides. In discussing this apparent paradox he says that Jobling and Petersen have shown that unsaturated fatty acids have a powerful effect in inhibiting autolysis, but that in the presence of iodine these acids on becoming saturated lose their inhibitory effect, so that the ferments causing autolysis are free to act. The active principle of the thyroid is probably produced by the breakdown of protein in the gland, that is, by autolysis. This process would, according to Jobling and Petersen, be facilitated by the presence of iodine in the gland, because the inhibitory effect of fatty acids in the blood would be diminished or done away with owing to their saturation with iodine. Possibly the curative action of iodides in tertiary syphilis may be explained by the thyroid effect of the drug in thus favoring an increase in the active secretion passed into the blood, and so facilitating the absorption of lowly organized tissues such as gummata, etc. The same would apply to the use of iodides in enlarged lymphatic glands.

Albeck. THE THYROID GLAND AND VOMITING DURING PREGNANCY. [Ugeskrift for Laeger, June 19 and 26, 1919.]

This observer has examined the thyroid in 1,581 women twenty-four hours after confinement, and has correlated his findings with the histories he obtained of vomiting during the last or earlier pregnancies. He found that vomiting during pregnancy was far more common among women with small and hard thyroids than among women with large and soft thyroids. Among forty-eight multiparæ with visibly and palpably enlarged thyroids there was not one with a history of vomiting during pregnancy. Of 195 multiparæ with palpably enlarged thyroids, there were 148 without a history of vomiting during pregnancy. Of 79 multiparæ whose thyroids were palpable but not abnormally large, there were fifty who had not suffered from vomiting during pregnancy. But of the 151 multiparæ whose thyroids were small and barely palpable, all had suffered from vomiting during every pregnancy.

Means, J. H., and Aub, J. C. BASAL METABOLISM AND HYPERTHYROIDISM. [Arch. Int. Med., Vol. 74, No. 4. J. A. M. A.]

So-called basal metabolism determinations were made by Means and Aub in three untreated cases of myxedema. All showed a definite reduction below that of normal individuals of the same age and sex. Similarly, the basal metabolism in an untreated cretin and in a case of cachexia strumipriva showed a marked reduction. In the latter case the fall in metabolism antedated the clinical appearance of hypothyroidism. In a case of carcinoma of the thyroid a moderate reduction in basal metabolism was found, both before and after thyroidectomy without clinical evidence of hypothyroidism. The metabolism of all patients studied during thyroid therapy was readily brought to normal or above by the administration of thyroid extract. The authors emphasize that the determination of the basal metabolism forms a sound and convenient method for governing the dosage of thyroid preparations in cases of hypothyroidism, and furnishes a far better guide in this respect than does the clinical picture. It is also of value as a means of differential diagnosis in obscure cases. In the treatment of hypothyroidism, doses of from 3 to 4 grains of thyroid extract, daily, should be ample to bring the metabolism to normal in two or three weeks, and doses of from 1 to 2 grains daily should usually be sufficient to keep it here. Cases of cachexia strumipriva may require larger maintenance doses than those of spontaneous hypothyroidism.

Boas, E. P. ASTHENIA OF CIRCULATION AND THYROID. [Arch. Int. Med., Vol. 24, No. 4.]

The use of the Goetsch test in a series of twenty-one consecutive cases was tried out and the conclusion reached that it is impossible to predict whether or not any given case and neurocirculatory asthenia is sensitive to epinephrin or not.

Lueders, C. W. LABORATORY DIAGNOSIS OF HYPERTHYROIDISM. [Arch. Int. Med., Vol. 24, No. 4.]

In Lueders' opinion the laboratory affords the most reliable means toward the recognition of early hyperthyroidism. The sugar tolerance test seems an important aid in the detection of borderline or early cases of hyperthyroidism. The epinephrin test did not prove in the study of the cardiac neuroses, diagnostic of hyperthyroidism. It seemed rather an index of the sensitization of the sympathetic nervous system. Its value as a diagnostic test is increased when blood and urinary sugar estimations are recorded with pulse rate and blood pressure. Intramuscular injections gave best results. Tests for nitrogen loss and acidosis seemed suggestive as aids in the diagnosis of toxic hyperthyroidism. Further studies are being made to discover if borderline cases or early hyperthyroidism reveal such changes. Creatinuria did seem present in the thyroid disorder group, and when taken in conjunction with the other tests, was of value in the diagnosis of early hyperthyroidism.

Richter, H. M. THYROIDECTOMY. [J. A. M. A., Oct. 25, 1919.]

The basic fault in the operation for toxic goiter, according to this observer is not so much in faulty technic as in leaving too much goitrous tissue and an amount of thyroid sufficient to produce the reactions observed in many cases. An excessive degree of activity is excited by the operation in the thyroid left behind. The removal of "two thirds" to "three fourths" of the thyroid will not do; we should leave only a few grams. Richter has carried out the radical operation in a series of cases, but the records are faulty in determining how many of the series were complete. But in a consecutive series of more than 100 cases, dating back over five years, there was only one death. A few preliminary ligations were made before he felt safe in doing the radical operation, and he thinks such are preferable in a very limited number of more critical cases. In several, he found that a larger amount than was intended was left behind, and the greater part of what was left was strangulated by sewing through and through with heavy catgut. While it thus left an amount to undergo necrosis, no bad results followed, and it reduced the operative time below what would have been required for further excision.

Biggs, M. O. WASSERMANN REACTION IN HYPERTHYROIDISM. [Missouri State Med. J., Vol. 16, No. 10. J. A. M. A.]

Biggs calls attention to the large percentage of hyperthyroid cases in State Hospital No. 1, Fulton, Mo., giving a positive Wassermann in which it was impossible, either from clinical history, physical examination or inquiry into the family records, to establish any syphilitic infection or taint. The patients were insane, with two exceptions, and their

cases had been diagnosed under the head of "thyroigenous psychosis." These individuals all became unmanageable to a greater or less degree at their respective homes, necessitating their confinement in an institution for the insane. The psychosis of each, in the main, was characterized by wild delusions, irritability which sometimes developed into acute excitement, slow speech and deliberate mentation, absence of suicidal or homicidal tendencies, lassitude and indifference to surroundings and apparent feeble-mindedness in some. There was in these cases a total lack of the symptoms which are manifested in a psychosis which results from syphilis infection, either acquired or inherited. The physical signs were such as one would find in the average case of this type. In most of the cases an exophthalmic state was found to exist with marked tachycardia and other symptoms which accompany conditions of this kind. In some of the cases the enlargement of the thyroid was more lateral and varied in size to a great extent. The changes in the skin, teeth, blood, and temperature of the body, are typical of this class of cases. The prevailing mental tone associated with the disease was fear and apprehension, frequently associated with hallucinations of hearing and vision; voices were heard saying disagreeable things and with these hallucinations occurred anxious and agitated states. A brief case history of twelve patients is given.

Kamamura, K. TRANSLATION OF THE THYROID GLAND WITH INTACT BLOOD SUPPLY. [Journal of Experimental Medicine, July, 1919.]

The author, using the Carrel technic of blood vessel suturing, made successful autoplasmic thyroid transplants in dogs, the thyroid gland remaining in good condition and functioning for several months after the transplantation, even when the circulation had been interrupted for one and one half hours. The author was not as successful in obtaining permanent homoplasmic transplantation of the glands. The circulation through the transplanted vessels is reported as being as good as normal.

Levi, L. THYROENDOCRINE FEBRICULA. [Presse médicale, May 12, 1919.]

Levi reports several cases of thyroid instability and testicular insufficiency in children and lays stress on the instability of body temperature associated with this combination. These children are sensitive to cold and subject to chills, but also exhibit in succession different types of fever, viz., temporary slight fever; later, more prolonged fever, and finally, actual febriculæ, rather persistent and leading to a suspicion of some hidden infection possibly tuberculosis. These febriculæ are due either to some slight inflammation causing fever by autoinfection—from adenoid and lymphatic tissues—the latter provoking a reaction of the heat centers, rendered hypersensitive by the coexisting hypothyroidia; or, to a paroxysmal growth tendency, the patient being subject to the

opposing influences of the thyroid and testicular insufficiencies. Thyroid therapy, where applicable, causes improvement, regularizing the temperature and obviating febricular reactions.

Cramer, W., and Frause, R. A. CARBOHYDRATE METABOLISM IN ITS RELATION TO THE THYROID GLAND. THE EFFECT OF THYROID FEEDING ON THE GLYCOGEN-CONTENT OF THE LIVER AND ON THE NITROGEN DISTRIBUTION IN THE URINE. [Proc. Roy. So., B, Vol. 86, 1913.]

Do. THE RELATION OF THE THYROID GLAND TO CARBOHYDRATE METABOLISM. [Seventeenth Inter. Congress Med., London, August, 1913.]

Cramer, W., and M'Call, R. CARBOHYDRATE METABOLISM IN RELATION TO THE THYROID GLAND—II. THE EFFECT OF THYROID-FEEDING ON THE GASEOUS METABOLISM. [Quart. Journ. of Experimental Physiol., Vol. XI, No. 1.]

Do. CARBOHYDRATE METABOLISM IN RELATION TO THE THYROID GLAND—IV. THE EFFECT OF THYROID FEEDING ON THE GASEOUS METABOLISM OF THYROIDECTOMIZED RATS. [Quart. Journ. of Experimental Physiol., Vol. XII, No. 2.]

Do. CARBOHYDRATE METABOLISM IN RELATION TO THE THYROID GLAND—III. THE EFFECT OF THYROIDECTOMY IN RATS ON THE GASEOUS METABOLISM. [Quart. Journ. of Experimental Physiology, Vol. XII, No. 1.]

Experimental hyperthyroidism produced by thyroid feeding leads in cats and rats to a complete disappearance of glycogen from the liver without however producing a glycosuria. Observations on the gaseous metabolism, the results of which are presented in the form of graphs, offer an explanation of this apparently paradoxical phenomenon. The first effect of thyroid feeding is to produce a mobilization of the liver glycogen. The carbohydrate thus thrown into the circulation is oxidized in addition to the carbohydrate preformed in the food. The heat production is thus increased. When the glycogen has been removed from the liver, carbohydrate is formed from protein and possibly also from fat. The action of the internal secretion of the thyroid gland on the liver glycogen lies thus at the root of the increased metabolism which is one of the characteristic features of hyperthyroidism. This conclusion is confirmed by the fact that removal of the thyroid gland does not impair the power of the cells of the organism to oxidize carbohydrate.

The condition of carbohydrate metabolism in experimental hyperthyroidism has a bearing on our conception of carbohydrate metabolism in general. For it shows

1. That mobilization of liver glycogen does not in itself produce glycosuria.
2. That the organism reacts to an influx of carbohydrate into the systemic circulation by an increased oxidation of carbohydrates.
3. That the special relation of carbohydrate metabolism to protein metabolism which finds its expression in the so-called "protein-sparing action of carbohydrates" is dependent upon the normal glycogenic function of the liver and is not dependent upon the oxidation of carbohydrates.

The practical suggestion is made that in Graves' disease a diet rich in carbohydrates is indicated to counteract the loss of flesh which is one of the features of the disease, due regard being paid to the danger of the development of diabetes mellitus. [Author's abstract.]

II. SENSORI-MOTOR NEUROLOGY

1. PERIPHERAL NERVES.

Wilson, G. POSTDIPHTHERITIC ATAXIA. [Am. Arch. Neur. and Psych., Vol. 2, No. 2. J. A. M. A.]

The three cases reported by Wilson are of interest from the type of sensory loss which they show, the loss of sensation being exactly similar to that seen in the combined sclerosis of pernicious or severe secondary anemia. The subjective symptoms which were complained of in these cases were of the same character that is so common in anemia. All three patients had paresthesias in the hands and feet, and all showed a loss or marked impairment of the sense of position and of vibration; in two of the cases with preservation of touch sense there was impairment of the ability to recognize the two points of a compass. Wilson believes he is justified in placing the lesions which account for the sensory loss in these cases in the posterior columns of the cord and not in the peripheral nerves.

Walshe, F. M. R. THE PATHOGENESIS OF DIPHTHERITIC PARALYSIS. [Quart. Jl. Med., Oct., 1918, Au., 1919. Med. Jl. Aust.]

F. M. R. Walshe sets out to combat the generally accepted view that diphtheria toxin possesses an elective action on certain parts of the peripheral and central nervous system. The opportunity presented itself for the study of a series of cases of extra-facial diphtheria among soldiers in the fighting lines. It was noted that ordinary diphtheria was prevalent among the troops; a certain number of men suffered from multiple neuritis without any preceding sore throat. Many of the men were noted to be suffering from septic sores, most frequently on the dorsum of the hands, on the forearms and around the knees. The sores corresponded to the condition known as Barcoo rot. Walshe found that the men who had facial diphtheria developed a local paraly-

sis, characterized by nasal voice, regurgitation of fluids through the nose and paralysis or paresis of the palate. This paralysis occurred as early as the sixth or as late as the thirty-fifth day and persisted for from two to twelve weeks. Associated with this was a loss of voice or paralysis of accommodation. No other ocular paralyses were seen. At times weakness of the sterno-mastoid muscles was noted. In three cases a facial paralysis was met with. He holds that the pharyngeal and laryngeal paralyses, and possibly the paralysis of the sterno-mastoids, constitute a local paralysis. The innervation of these parts is derived from one source, namely, the glosso-pharyngeal-vagus-accessorius nuclear system and its peripheral fibers. These paralyses were not met with in cases of extra-faucial diphtheria. He suggests that the toxin is carried along the perineural lymphatics from the infecting focus to the corresponding nerve centers. In the extra-faucial cases he noted other local paralyses, the distribution of which was explained in the same manner. In addition to these local signs, there was commonly observed a multiple neuritis, manifested by weakness and aching of the legs, unsteadiness of gait, clumsiness of the hands and paresthesias. On examination the patients were usually found to have some degree of tachycardia. The abdominal reflexes were always conserved, while the plantar reflexes were affected in a few instances. There was in many cases a definite increase of the knee jerks before the loss set in. This polyneuritis was noted in all cases of diphtheria, whether faucial or not. Walshe regards the paralysis of accommodation as a specific lesion, at all events to some extent. It was more common in faucial diphtheria, but was noted in 33 per cent. of extra-faucial cases. He is inclined to disregard this as a local sign and to classify it as a specific action of the toxin. He adduces evidence to show that while the toxin is carried by the lymph stream in the local nervous affections, it is conveyed by the blood stream in both the generalized and the specific. In dealing with the paralysis following septic sores, he is inclined to the view that a secondary diphtheritic infection occurred. He appends some clinical data in support of his thesis that local diphtheria in any situation may give rise to localized lesions in the central nervous system.

Saleeby, N. TREATMENT OF HUMAN BERIBERI WITH AUTOLYZED YEAST EXTRACT. [*Philippine Jl. Sc.*, Jan., 1919. J. A. M. A.]

About twenty cases of human beriberi were treated by Saleeby with autolyzed brewers' yeast extract. Adults were given from 150 to 40 cc. three times a day. Children were given from 2 to 4 c.c. every three hours. Larger doses did not seem to give better results. No sign of poisoning was observed. Only acute and uncomplicated symptoms of beriberi were observed under treatment. Chronic nerve, muscular, or cardiac lesions were actually unaffected. All acute peripheral symptoms of neuritis were affected quickly. Marked results were noted in less than three days and a week's treatment seemed to give full relief

in mild acute cases. Treatment was generally followed up for two weeks at least. Infantile beriberi symptoms were relieved with comparative rapidity. Edema yielded quickly, and nutrition improved at once. No special diet was prescribed. Patients were given regular hospital diets in accordance with the state of their digestion. Children receiving the extract continued to nurse at the mother's breast. The effect of the autolyzed yeast extract used is similar to that produced by the hydrolyzed extract of rice polishings; it seemed weaker, however.

Paulian, D. E. NEUROLOGICAL SIGNS IN TYPHUS. [Rev. Neur., Aug., 1919, No. 8.]

The author points out a tardy meningeal reaction in typhus, and unequal pupils which have been observed in 60 per cent. of his cases. Neuritis is also common, fifty-five cases were observed. Facial diplegia developed nine months after the typhus, in two others during convalescence from the disease.

Gordon, A. TOXIC INFECTIOUS MULTIPLE NEURITIS. [N. Y. Med. Jl., Oct. 4, 1919.]

In this interesting report seventeen cases are taken up in detail. In most of the cases the neuritis followed some infectious disease—as follows: Measles, two cases; pneumonia, three cases; typhoid, five cases; puerperal states, three cases; influenza, two cases. The author suggests that hepatic insufficiency might be responsible for the trouble, but offers no suggestions as to the mechanism involved.

Pitres, A., and Marchand, L. ULNAR NERVE PALSY AND CLAW HAND. [Revue Neurolog., Vol. 26, No. 5. J. A. M. A.]

Pitres and Marchand give illustrations of different types of what they call *griffes cubitales*. The thumb and the index finger are normal, but the little finger, the ring and sometimes the middle finger are flexed to a degree to amount to a deformity. They have encountered 163 cases of the kind consecutive to war wounds. This vicious attitude of these fingers is a frequent but not a pathognomonic symptom of traumatic paralysis of the ulnar nerve. It develops in about 90 per cent. of the cases of ulnar injury, but it may occur even without injury of this nerve. The fingers are held in this position at first merely to avoid pain, and then the position becomes irreducible and incurable on account of the neurotrophic lesions which develop in the tissues around the joints. In other cases the deformity is primary, the result of the functional contracture of the fibers of the flexor longus added to the symptoms proper of the lesions of the ulnar nerve. There is also a group of false *griffes cubitales* from contracture of hysterotraumatic origin, or cicatricial retraction, etc.

Harris, W. THE NERVOUS SYSTEM IN INFLUENZA. [Practitioner, February, 1919.]

Harris believes that there is no acute malady after which disturbance of the nervous system is so frequent as influenza, and none that has such varied sequelæ. Indeed, since the last great pandemic of the early 'nineties there is scarcely a disease of nerve cell or fiber that has not been ascribed to this most searching of diseases. The nervous symptoms appearing at the onset comprise severe pains at the back of the eyeballs, frontal headache, pains in the back and limbs and intense physical and mental prostration. In favorable cases the pains and lassitude pass off in a few days. In a great number of cases, however, the story is not so simple, and the tale of symptoms is lengthened by a formidable list of complications and sequelæ. In addition to the slow heart and fainting, with sudden syncopal attacks that may occur at the onset, the action of the heart may later become irregular or extremely rapid. The initial headache may persist and assume a meningitic form. Optic neuritis, with choked discs and retinitis, was not infrequently seen in the epidemic of the early 'nineties. Vision may be damaged by retro-bulbar neuritis. Embolism and thrombosis of the central artery of the retina have been recorded, while varying degrees of ophthalmoplegia have been common. Hysteroid convulsions may first draw attention to the patient's serious condition and they may be followed by fainting, stupor or even a cataleptic state. In this category comes *nona*, or a condition of apparent death, lasting for days, one of the scares of the year 1890. Spinal disorders that may complicate influenza are acute anterior poliomyelitis, disseminated myelitis and *herpes zoster*. Polioencephalitis has been reported. Bulbar crises, resembling the attacks seen in children with diphtheria, characterized by spasm of diaphragm or glottis have been met with, and may be rapidly fatal. Serious attacks of local neuritis, particularly brachial and sciatic neuritis, attended by trophic lesions, have been seen, while a most formidable complication, in the form of peripheral multiple neuritis, is not unknown. Among other complications and sequelæ, prolonged loss of power of smell and taste is peculiar to influenza; progressive bulbar palsy and myasthenia have apparently been precipitated by an attack; epilepsy and migraine have become aggravated; paresthesiæ of all sorts and descriptions have followed, and, lastly, as illustrating the extraordinary effect of influenza upon the mental functions, loss of memory and an intense inertia of mind and body may be a lasting legacy.

Roger, A. ABDOMINAL PARESES [Paris Med., Sept. 27, 1919.]

War wounds of the lumbar nerves have not been reported very frequently. Roger gives an illustration of a case of war wound of lumbar nerves which had resulted in paralysis of part of the abdominal wall. The wall in this region had lost its elasticity and protruded as is seen at times in poliomyelitic palsies.

Laan, H. A. TIBIALIS ANTICUS PARALYSIS. [Ned. Tijds. v. Geneesk., Aug. 9, 1919. J. A. M. A.]

Laan has already published three comprehensive articles on the sequelæ of poliomyelitis, seeking to determine the best technic for orthopedic treatment in the individual case. He here discusses what is to be done for isolated paralysis of the tibialis anticus, reporting seventy-five cases, including four with bilateral paralysis, thus a total of seventy-nine cases. There was paralysis in the thigh or in the other leg besides in forty-six cases, bilateral in seventeen. The literature has dealt mainly hitherto with paralysis of the tibialis posticus. In none of the seventy-nine anticus paralysis cases was any improvement in the paralysis observed; the paralysis or the weakness persisted unmodified. In seventy cases the paralysis dated from before the fourth year and in forty-eight there had been no attempt at orthopedic treatment although the paralysis was of up to six years' standing in thirty and from seven to eighteen years in eighteen. All kinds of treatment had been applied except operative and orthopedic measures. Some of the patients could only crawl, and some others could not do even this. After the operation the patients have to be left in others' hands, and it is important to make the after-treatment as simple as possible. Massage and electricity have to be omitted on this account and the main reliance placed on keeping the foot in a good position and getting the patient on his feet. In ten of the cases only special shoes were found necessary to accomplish this; in thirty-two a walking stirrup was provided which was worn at night also; in thirty-eight special shoes were worn during the day and a correcting apparatus at night. Only two of the total number were unable finally to walk unsupported. The war has compelled revision of the results of treatment of infantile paralysis. This has emphasized the necessity for classifying cases for treatment by the age, and also the possible necessity for resection of the plantar aponeurosis and of the skeleton to the foot. Too much stress used to be placed on tendon transplantations, etc. In his own series the outcome is not known in eleven and three have died since. The outcome was poor in twelve, but in all the forty-four other cases the treatment may be considered a success. The most favorable results were obtained when the extensor digitorum was utilized in place of the tibialis anticus. Only once did it fail when fastened along the anticus without being cut. In all the other cases it seemed to answer the purpose excellently, and it never exerted too strong traction. In a few cases only half the muscle was utilized. Its normal function is not missed, the extensor hallucis and the two peroneus muscles assuming its function. He reiterates that it is thus possible to obtain much better results than formerly believed attainable. He describes typical cases of the seven different forms in which this paralysis may present itself, with the orthopedic indications in each group. The greatest difficulty is from paralysis of other muscles

which make excessive demands on the correction. But it is in these very cases that the greatest benefit may be realized.

Chiray et Roger, E. THE "MUSCULAR SYNDROME" OF SCIATICA. [Bull. et mém. Soc. méd. d. hôp. de Par., 43, 1919, 73.]

Muscular atrophy, hypotonus, exaggeration of idio-muscular contractility, and changes in electrical excitability are the chief signs in this syndrome. In exceptional cases only do these symptoms amount to paralysis. They frequently give rise to weakness localized to certain muscles of the leg. The atrophy usually remains slight. It begins and is most pronounced in the foot. Barré has shown that it is seen in the extensor brevis digitorum more particularly. In some patients the plantar muscles are morbid. Later, in the severe and persistent forms, the atrophy affects the gastrocnemius, soleus, peronei or tibialis anticus. Atrophy of the thigh and buttock may be observed later. Exaggeration of idio-muscular contractility has been extensively studied by Villaret and Faure-Beaulieu, who have shown that percussion of the gastrocnemii causes a larger and longer contraction on the affected side than on the sound side, giving rise to a slow and exaggerated plantar flexion.

Tanfani, G. SCIATIC PARALYSIS FROM QUININE INJECTIONS. [Riforma. Medica, September 20, 1919.]

This paper reports three cases of paralysis of the sciatic or its branches following intragluteal injection of quinine for malaria. In the first case the external popliteal nerve was severely damaged, but there was only a slight irritation of the fibers of the internal popliteal manifested by the presence of pain on palpation of the nerve trunk, and absence of the tendo Achillis jerk. In the second case the external popliteal nerve was chiefly affected, but involvement of the internal popliteal was shown by pain and diminution of electrical excitability. In the third case there was complete paralysis of all the muscles of the leg and foot, indicating a damage to the whole of the sciatic nerve. W. Murray, in the discussion on malaria at the clinical meeting of the British Medical Association last April, said he had seen two cases each of musculo-spiral and sciatic paralysis following hurried intramuscular injections of quinine.

2. CRANIAL NERVES.

Schoenberg, M. J. ACUTE RETROBULBAR NEURITIS IN A CHILD. [Arch. Ophth., Jan., 1919.]

M. J. Schoenberg relates the case of a child of four years who suddenly lost the sight of both eyes. On examination the pupils were found to be dilated, equal, regular and did not react to light. There was papilledema of 2 D in each eye; no hemorrhages or exudates. Colon

irrigation resulted in the removal of large quantities of evil-smelling feces, and the sight immediately began to improve and the pupils to react. Later it was observed that the boy had a central scotoma. High enemata still produced a large stool and X-rays showed a redundancy of the sigmoid and descending colon. About two months later the discs showed some temporal atrophy and blurring of the margins. The vision was still bad. There were no signs of increased intracranial pressure. The toxins were probably absorbed through the injured intestinal mucosa.

Chávez, S. TRIGEMINAL NEURALGIA. [Crónica Medica, Aug., 1919, J. A. M. A.]

Chávez refers to cases of trigeminal neuralgia in which syphilis, malaria, anemia, tuberculosis, diabetes, gout or rheumatism could be incriminated as the principal factor causing the neuralgia. He describes also local and reflex trigeminal neuralgia, and reports a case in which supra-orbital neuralgia of long standing disappeared after removal of a fibromyomatous uterus. In another case the agonizing right supra-orbital neuralgia developed at the third month of pregnancy in an otherwise healthy woman of thirty. As no relief was obtained from the usual measures, the whole of the right supra-orbital nerve was resected, but the pains continued with even greater intensity until delivery. Then the neuralgia vanished completely and the woman has been in good health since. Syphilis should always be suspected with neuralgia, especially when the pains are worse early in the night, a dull ache keeping up all the time with occasional paroxysms of pain, never very violent. If the neuralgia is bilateral, this in itself renders a syphilitic origin almost certain, even when there are no other symptoms from it. The coexistence of neuralgia elsewhere is also significant, as is the case likewise with lymphocytosis in the lumbar puncture fluid, with not very severe neuralgia. In the third stage of syphilis the neuralgia is usually due to mechanical irritation, and it passes from the phase of pain to that of paralysis and then to trophic disturbances. If treatment for the syphilis does not rapidly improve the neuralgia, some other explanation for the latter will have to be sought.

With a malarial origin, the almost constant localization in the frontal branch of the trigeminal is suggestive, and also the periodicity of the pains, sometimes accompanying or taking the place of the chill and fever. The neuralgia usually occurs mornings, at the same hour, and the region aches a little in the intervals, and there are liable to be vasomotor disturbances, conjunctivitis and epiphora. If quinin does not cure malarial neuralgia in three or four days, it does no good to keep it up indefinitely. Anemia is a frequent cause of neuralgia, especially trigeminal. "The nerve is shrieking for a more nourishing blood." The neuralgia in diabetes is usually but not always symmetrical. When

neuralgia resists all other measures, it might be well to try a course of antidiabetic diet. With neuralgia in gout or rheumatism, tincture of colchicum or the salicylates are indicated; neuralgia caused by these conditions moves about from joint to joint and may alternate with psoriasis or hemorrhoids or with the joint attacks. When alcohol or tobacco is an important factor, benefit follows their disuse. The trigeminal neuralgia with hysteria does not yield to the ordinary measures, including hydrotherapy, bromids, valerian, psychotherapy or electricity, while organic neuralgia usually is more or less modified by these. In the exceptional cases in which benefit has followed operation for hysteric trigeminal neuralgia, there has usually been some slight lesion in one of the branches of the trigeminal nerve, and the removal of the latter favorably modified the neuralgia.

Gascard, E. INJECTION OF THE INFERIOR MAXILLARY NERVE AT THE FORAMEN OVALE. [*Presse médicale*, August 25, 1919.]

Gascard notes that in the procedures hitherto recommended for reaching the inferior maxillary nerve at the foramen ovale, *e.g.*, for alcohol injection, the point of entrance of the needle is always below the zygomatic arch. There is some risk of injuring the internal maxillary artery, and some experience is required to keep the needle precisely in the required direction, lest it miss the pterygoid process and thus fail to reach the second landmark necessary for reaching the foramen. He recommends instead the suprazygomatic route. The first landmark is the angle, opening upward, formed by the zygomatic arch and the malar bone. The needle rests on this bony angle and is introduced in a direction perpendicular to the plane of the angle. Having penetrated for two and a half centimeters, it reaches the vertical portion of the greater wing of the sphenoid. The needle point being then lowered a few millimeters, it passes beyond the angle which the vertical portion of the wing of the sphenoid forms with its horizontal portion. The needle is now pushed in further in the same direction, its point hugging the lower surface of the greater wing, until it reaches the foramen ovale exactly five centimeters from the superior zygomaticomalar angle. The lower surface of the greater wing forms in some degree a groove which conducts the needle to the foramen. Were the needle not introduced in the proper direction, it could not pass in five centimeters without striking either the pterygoid process anteriorly or the spine of the sphenoid posteriorly. The region traversed by the needle in this procedure is remote from any important artery or nerve.

Pleth, V. CERVICAL SYMPATHECTOMY IN THE CURE OF FACIAL NEURALGIA. [*American Journal of Surgery*, May, 1919.]

The author states that in the treatment for facial neuralgia deep injection of alcohol had given him the best results though pain re-

turned in from nine to twelve months. In a few cases keratitis or even the loss of an eye had been observed. In performing the operation of cervical sympathectomy alcohol had been injected at all points of exit of the trigeminal from the skull; the inside of the foramen ovale had been avoided. It usually takes about three months before any definite relief is manifested. In one case where the injection had been made for facial neuralgia a previous neuralgia of the radial and ulnar disappeared.

Sicard. TREATMENT OF ESSENTIAL FACIAL NEURALGIA BY LOCAL ALCOHOLIZATION. [Boston Med. and Surg. Journ., September, 1918.]

In this report the author says that in his opinion the best and most effective treatment of essential facial neuralgia is by chemical destruction of the branches of the nerve. He uses 70 per cent. to 95 per cent. alcohol and injects not more than 1.5 c.cm. under local anesthesia into the foramina which can be reached. He prefers to inject the superficial foramina several days before the deep. Relapses may occur in from twelve to eighteen months. There are two indispensable conditions, the first of which is that the case must be one of the so-called essential or somatic variety. These points are given in differentiation. The case is not somatic (1) when the pain persists continually; (2) when neuralgia, untreated previously, is accompanied by anesthesia of skin or mucous membrane; (3) when neuralgia, untreated, is complicated by affection of other cranial nerves, shown by trismus, diplopia, facial paralysis, lingual hemiatrophy, etc.; (4) when the neuralgia, *ab initia*, affects the three branches of the trigeminal nerve. In such a case the neuralgia is secondary to some exo- or endo-cranial lesion, such as syphilis, tuberculosis, cancer, abscess, sinusitis, or is psychogenic. Nor is the injection of alcohol of use in post-herpetic neuralgia. The second essential condition is really a reflex of efficient injection, namely the production of anesthesia of the area supplied by the injected nerve, which should supervene directly after the injection and may be accompanied by a false sense of induration and swelling.

Ransohoff, J. TRAUMATIC FACIAL DIPLEGIA. [Ann. Surg., Vol. 70, No. 2. J. A. M. A.]

Ransohoff reviews the literature and records one personal case in which the lesion on each side was in the fallopian canal, below the geniculate ganglion, and at a point above where the chorda tympani is given off. It was also below the point where the nerve to the stapedius is given off, since there is no record of hyperacusis. Although there was a fracture across the base of the skull, through the mastoid and petrous portion of the temporal bones, as shown by the ecchymosis behind the ear, neither nerve was severed. Of the right nerve one can be sure of this, since the paralysis did not manifest itself until

two days after the injury. Hemorrhage only could have accounted for this late occurrence. On the left side the paralysis was instantaneous, but since it completely and speedily recovered it is likely that here also there was only a contusion with hemorrhage. Traumatic facial diplegia is an exceedingly rare condition. Ransohoff has been able to get only four other cases from the literature. All of the patients recovered. In none of the cases was a decompressive operation indicated in the judgment of the surgeons in charge.

Ohm, J. THE LABYRINTH OF THE EAR AS A CAUSE OF SQUINTING. [Zt. f. Augenheilkunde, 1917, Bd. 36, Nos. 5-6.]

Research on nystagmus justifies the conclusion that the innervation disturbances producing squinting, start from the labyrinth of the ear. Analysis of a number of cases has shown a distinct labyrinthine influence in convergent strabismus with different levels of deviation. If hypermetropia is associated with pure convergent strabismus, and compensations for the former corrects the latter, the Donder theory suffices. But when, especially in very young cases, the curative effect of glasses fails, or if the eye is normal or even myopic in structure, the cause of the squinting will have to be ascribed to the labyrinth. Labyrinthine influence is sometimes sufficient to overcome normal functional capabilities. Interference with fusion, lack of acuteness, a high degree of refractory disturbance, etc., increase the possibility of labyrinthine confusion of binocular harmony. The nystagmus of mountain people is an incalculable aid for investigation of the relation between optic and motor innervation. The author concluded from this that the nuclei of the ocular muscle situated at the base of the fourth ventricle were subjected to two opposed innervations, one an exciting, confusing innervation from the labyrinth, and the other a restricting, regulating one from the cerebrum. Everything affecting the activity of the latter, such as darkness, diminution of acuteness of vision, made the former more pronounced.

The writer considers it probable that the labyrinth is the cause of latent squint deviation. Divergent strabismus, he feels, may also be of labyrinthine origin. Pronounced squinting may disappear in narcosis. This might also be a sign of labyrinthine influence. Many labyrinthine disturbances such as tremor in the dark, disappear shortly after the beginning of narcosis, but others like rotary nystagmus continue for a long time. Convergent strabismus frequently improves with time, for the labyrinthine factor that earlier in life was of the utmost importance gradually recedes into the background. After paralysis of eye muscles, a high degree of contraction is developed in some cases. Here the labyrinthine tonus may react according to the individual. The labyrinthine explanation of squinting renders comprehensible the great lack of success with conservative and operative treatment. Experimental

diminution of irritability of the labyrinth is possible by means of cold, and by galvanic current [anode]. Alcohol, chloral, paraldehyde, adalin, aleudoin, and luminal influence the labyrinth.

Castex, A. THE EAR AND DEAFNESS IN MUSICIANS. [Bulletin de l'Académie de médecine, June 10, 1919.]

This paper points out that among musicians various forms of deafness determine special symptoms not observed in other patients. Anatomically the musician's ear presents no special characteristics, but physiologically it does, perceiving details, such as harmonics, which escape the ear of the nonmusical. It is the musician's brain, however, rather than his ears which perceives these minor details. Grouping his cases, the author found that deafness may alter the intensity, pitch, and timbre of the sounds heard. The ear undergoing sclerosis can no longer hear any but the acute and metallic sounds. It hears nothing of the words uttered by the singer. As regards pitch, there are cases of diplacusia. One ear hears correctly and the other half a tone or even an octave lower. There are also faulty perceptions of tonality, and prolonged persistence of sounds. As concerns timbre, the sounds lose their musical quality and are heard simply as noises; or the instruments may seem to have a nasal or a silverlike quality. Painful hyperacusia is not uncommon among deaf musicians. Some fall into syncope from the action of intense sounds—organ or brass band—because their diseased ear has lost the services of its inhibitory apparatus. The prognosis depends on the temporary or permanent nature of the otic disorder; but incomplete deafness does not keep a musical ear from appreciating the qualities and accessory effects of sounds.

Marage. CAUSES AND DURATION OF WAR DEAFNESS. [Bulletin de l'Académie de médecine, June 10, 1919.]

Experiments with explosives are here discussed with bearing on this question. The curves obtained indicated that the initial excess of atmospheric pressure induced by discharge of modern explosives is at least 150 to 300 kilograms to a square centimeter and that the initial rate of displacement of the pressure waves is 2,000 to 3,000 meters a second. They showed also that the excess pressure and its rate of displacement decrease rapidly as the distance from the center of explosion increases, the pressure falling to two or three kilograms to a square centimeter at a distance of twenty meters, and being practically nil at a distance of fifty or sixty meters. In some instances, however, an excess pressure of one millimeter of mercury was registered 1,300 meters away from the explosion of a large caliber shell. Simple explosive charges showed a uniform diffusion of the pressure waves about the center of explosion. In the case of shells, however, there was a zone of very high pressure exactly lateral to the exploding projectile, cones of somewhat lower

pressure in front of and behind the projectile, and in between these, dead spaces, or rather spaces of negative pressure. Soldiers exposed to these dead spaces have experienced a sensation as of being expanded, drawn out, or emptied. Penetration of the shell more or less deeply into the soil, and the presence of obstacles such as walls, may considerably modify the results, *e.g.*, by inducing reflected waves which interfere with the primary waves. The wide variation in the clinical effects from nearby shell explosions is easily understood in view of these facts.

The enormous excess of pressure must in some instances produce permanent injury to the ears; hence the fact that in cases of war deafness, with or without dumbness, the patients are not recovering in a ratio of ninety-eight per cent., as had at first been hoped. This is illustrated by the fact that in the aural service at Bourges the degree of deafness has been found to remain unchanged after the third month, and that the number of men receiving special privileges for deafness is not diminishing as time elapses.

Lafon, C. NYSTAGMUS AND NODDING SPASM. [Jl. Med. de Bordeaux, Oct. 10, 1919.]

A boy of twelve with rotatory nystagmus is here reported. In early childhood he had had a nodding spasm, apparently a psychogenic compulsion neurosis from superficial description. Lafon has also seen horizontal nystagmus in youths and soldiers and in one man of thirty, accompanied in all with nodding spasm, but without isochronism, except that the nystagmus usually appears only as the nodding ceases. His attempts to force the two conditions into a formula are not very successful.

McNaught, H. Y. PARALYSIS OF THE ESOPHAGUS. [Calif. State Jl. Med., Vol. 17, No. 10. J. A. M. A.]

McNaught reports two cases due to occlusion of the right posterior inferior cerebellar artery probably the result of arteriosclerosis. He suggests that when confronted by a case of sudden inability to swallow, the syndrome of occlusion of the posterior inferior cerebellar artery, should always be kept in mind.

Heitger, J. D. DIAGNOSTIC SIGNIFICANCE OF VERTIGO TO THE GENERAL PRACTITIONER. [Kentucky State Med. Assoc., Sept. 22, 1919. J. A. M. A.]

Vertigo may be caused by (1) a lesion in the ear or of the eighth nerve, such as hemorrhage, effusion, labyrinthitis, inflammation of the middle ear producing congestion and irritation of the labyrinth, leukemic infiltrations, trauma, neuritis, low grade specific meningitis, etc.; (2) lesions affecting the intracranial pathways, such as hemorrhage, trauma, tumor, abscess, thrombosis, infarction, tubercle and gumma, multiple

sclerosis, syringomyelia, meningitis of various types, poliomyelitis; (3) involvement of the ear mechanism by toxemia from any organ or part of the body, chemical poisoning from alcohol, lead, salicylates, quinin, infectious fevers and focal infections; (4) involvement of the ear mechanism by ocular disturbances or by circulatory disturbances, cardiorenal and cardiovascular conditions. Vertigo involves essentially a study of the vestibular apparatus. It signifies a disturbance of that apparatus.

3. SPINAL CORD.

Holman, E. LUXATION OF LUMBAR VERTEBRA. [Jl. Am. M. Assoc., Nov. 1, 1919.]

While the dislocation of one vertebra on another has been mentioned as a possible cause of birth palsy, the author in the survey of the literature finds no mention of such a case as he reports. The child was brought to the Children's Hospital School in Baltimore with the diagnosis of spinal curvature. The mother was small in stature, with undersized pelvis, and this was her only living child from four pregnancies. The child when received at the hospital was four years, eight months old, with evidently retarded development. The hips were well developed but the calves and feet were puny. There was a definite scoliosis to the right with a remarkable lordosis in the lumbar region at the level of the first and second vertebræ. The scoliosis could be corrected with force, but the lordosis resisted complete reduction. The child could stand on a broad base by supporting himself on a chair. A roentgenogram showed a scoliosis of medium degree and laterally a distinct break in the normally regular alignment of the vertebral bodies occurring between the first and second lumbar vertebræ. There was no spina bifida. Scuttar's operation to correct the extreme flexion at the hip was performed and the child was provided with a combined spinal and long paralytic brace which should with practice enable it to get about. While the possibility of lumbar vertebra dislocation has been considered doubtful the report of two authentic cases by Blasius has dispelled this doubt. No birth injury similar to this, in which the child survived, seems to be mentioned in the literature. The scoliosis could also be considered as a birth injury in Holman's opinion as there was no roentgenographic evidence of the anomalous conditions mentioned by Bohm, or of the wedge-shaped supernumerary vertebræ reported by Fitzwilliams and Norbury. Apparently, injury at birth is a cause of congenital scoliosis.

Cannata, S. POLIOMYELITIS. [La Pediatria, 27, 1919, 465.]

This clinical and statistical paper on poliomyelitis as occurring in and about Naples, gives a short history of the disease in Italy. It first made its appearance, he incorrectly states, in 1883. It is

not notifiable in Italy, where it has never assumed a very extensive epidemic form. From January, 1914, to June, 1919, 375 cases were brought to the Naples pediatric clinic. The majority of the patients were at the commencement of the paralytic period, and only a few at an advanced stage of the disease; 120 cases were in the first year of life, 129 between one and two years, twenty-five between two and three, and one was aged four. In the first year there were seven children aged two months and six aged three months; 163 were males and 112 females. Morbid heredity (neuropathy, alcoholism, syphilis, and tuberculosis) was found in about 40 per cent. About 15 per cent. of the remainder had suffered from various acute infections shortly before being attacked by infantile paralysis, and in some there was no hereditary or individual predisposition; 188, or 68.7 per cent., presented paralysis of the lower limbs, and thirty-seven, or 13.4 per cent., paralysis of the upper limb. The right lower limb was less frequently affected (fifty-eight cases) than the left (sixty-three cases), and a larger number still (sixty-seven) showed paralysis of both lower limbs. In the upper limbs, on the other hand, the reverse occurred, the right upper limb being more frequently affected (nineteen cases) than the left (thirteen cases), and both upper limbs were involved in only a few instances (five cases). No cerebral, bulbar, or purely meningeal forms of the diseases were observed.

Garrison, W. H. SIR WALTER SCOTT'S LAMENESS. [J. A. M. A., Correspondence.]

Reference has recently been made, by Crookshank and others, to the childhood lameness of Sir Walter Scott as a definite case of infantile poliomyelitis. The attack came on in 1773, when Scott was about eighteen months old, some ten years before the publication of Michael Underwood's well-known account of the disease (1784). The details, as given in Lockhart's *Life of Scott*, may be not uninteresting to American physicians:

"I showed every sign of health and strength until I was about eighteen months old. One night, I have often been told, I showed great reluctance to be caught and put to bed, and after being chased about the room, was apprehended and consigned to my dormitory with some difficulty. It was the last time I was to show such personal agility. In the morning I was discovered to be affected with the fever, which often accompanies the cutting of large teeth. It held me three days. On the fourth, when they went to bathe me as usual, they discovered that I had lost the power of my right leg. My grandfather, an excellent anatomist as well as physician, the late worthy Alexander Wood, and many others of the most respectable of the faculty, were consulted. There appeared to be no dislocation or sprain; blisters and other topical remedies were applied in vain. When the efforts of regular physicians

had been exhausted, without the slightest success, my anxious parents, during the course of many years, eagerly grasped at every prospect of cure which was held out by the promise of empirics, or of ancient ladies or gentlemen who conceived themselves entitled to recommend various remedies, some of which were of a nature sufficiently singular. But the advice of my grandfather, Dr. Rutherford, that I should be sent to reside in the country, to give the chance of natural exertion, excited by free air and liberty, was first resorted to, and before I have the recollection of the slightest event, I was, agreeably to this friendly counsel, an inmate in the farmhouse of Sandy-Knowe. . . . It is here at Sandy-Knowe, in the residence of my paternal grandfather, already mentioned, that I have the consciousness of existence; and I recollect distinctly that my situation and appearance were a little whimsical. Among the old remedies recurred to to aid my lameness, some one had recommended that so often as a sheep was killed for the use of the family, I should be stripped and swathed up in the skin, warm as it was flayed from the carcass of the animal. In this Tartar-like habiliment I well remember my grandfather, a venerable old man with white hair, used every incitement to make me try to crawl. I also distinctly remember the late Sir George MacDougal of Makerstoun, father of the present Sir Henry Hay MacDougal, joining in this kindly attempt. He was, God knows how, a relation of ours, and I still recollect him in his old-fashioned military habit (he had been colonel of the Greys), with a small cocked hat, deeply laced, and embroidered scarlet waistcoat, and a light-colored coat, with milk-white locks tied in a military fashion, kneeling on the ground before me, and dragging his watch along the carpet to induce me to follow it. The benevolent old soldier and the infant wrapped in his sheepskin would have afforded an odd group to uninterested spectators. This must have happened about my third year, for Sir George MacDougal and my grandfather both died shortly after that period. . . . I was in my fourth year when my father was advised that the Bath waters might be of some advantage to my lameness. My affectionate aunt, although such a journey promised to a person of her retired habits anything but pleasure or amusement, undertook as readily to accompany me to the wells of Bladud, as if she had expected all the delight that ever the prospect of a water-place held out to its most impatient visitants. My health was by this time a good deal confirmed by the country air, and the influence of that imperceptible and unfatiguing exercise to which the good sense of my grandfather had subjected me; for when the day was fine, I was usually carried out and laid down beside the old shepherd, among the crags or rocks round which he fed his sheep. The impatience of a child soon inclined me to struggle with my infirmity, and I began by degrees to stand, to walk, and to run. Although the limb affected was much shrunk and contracted, my general health, which was of more importance, was much strengthened by being frequently in the open air, and, in a word, I who in a city had

probably been condemned to hopeless and helpless decrepitude was now a healthy, high-spirited, and, my lameness apart, a sturdy child—*non sine diis animosus infans*."

The shrinking and contraction of the limb is strongly suggestive of the affection described by Underwood and Heine. There have even been apparent figurations of the disease in art, for instance, on an Egyptian stele of the eighteenth dynasty in the Carlsberg Glyptothek at Copenhagen (Bull. Soc. franc. d'hist. de méd., Paris, 10: 408, 1911); or the picture of the paralytic beggar boy by Ribera in the Vienna gallery. In a footnote to the article on Sir Walter Scott in the ninth edition of the Encyclopedia Britannica (p. 545), Dr. Charles Creighton says that Scott's primary trouble was "a swelling at the ankle, and either consisted in or gave rise to arrest of the bone-forming function along the growing line of cartilage which connects the lower epiphysis of each of the two leg-bones with its shaft. . . . The limb would have been blighted very much more if the arrest of growth had taken place at the upper epiphysis of the tibia or the lower epiphysis of the femur. The narrowness and peculiar depth of Scott's head point to some more general congenital error of bone-making allied to rickets, but certainly not the same as that malady. The vault of the skull is the typical 'scaphoid' or boat-shaped formation, due to premature union of the two parietal bones along the sagittal suture." Creighton goes on to say that this synostosis of cranial bones is characteristic in microcephalous idiots, and he relates that an eminent French anthropologist, who saw a microcephalic skull in the Cambridge Museum of Anatomy, pointed to the scaphoid vault of the crown and the effaced sagittal suture, with the exclamation: "Voilà Walter Scott!" Scott's brain was found to be small in size after death, a fact of little moment in itself, since there is apparently no special relation between cranial capacity, brain weight and ability. Turgenieff and Cuvier had the largest and heaviest brain, Shelley, Scott, Mozart, Gambetta and others, among the smallest.

F. H. GARRISON, M.D., Washington, D. C.

Reta, B. TREATMENT OF INFANTILE PARALYSIS. [Medicina Ibera, June 14, 1919.]

From a consideration of the last epidemic in Granada this paper outlines the treatment of acute anterior poliomyelitis as follows: (1) Absolute rest in bed for several weeks after the febrile period is past; (2) calcium chloride to diminish exudates and transudates; (3) urotropin 0.3 to 1.5 gram daily according to age; (4) lumbar puncture once or twice during the febrile period according to the pressure and generalization of the paralysis; (5) diet and symptomatic treatment in accordance with the initial manifestations of the respiratory or gastrointestinal tract; (6) disinfection of the mouth, nose, and pharynx, not

only of the patient but of all the members of the family, with hydrogen peroxide, and iodine in glycerine; (7) hygiene appropriate to an infectious and contagious disease.

Grossman, J. SPASTIC PARALYSIS IN CHILDREN. [Medical Record, September 13, 1919.]

Grossman, after discussing a number of cases, sums up as follows: Spastic paralysis may result from an apparently normal delivery. Infants who apparently recover may develop a spastic hemiplegia at a later period. A guarded prognosis should be given in all cases. In a number of cases the only clue to a cerebral injury is the presence of stiffness which mothers notice when bathing and dressing the children. In other cases delaying functions of sitting and walking direct one to the existing spastic condition. Convulsions in infants, either immediately or shortly after birth, should make us suspect cerebral injury. The possibility of syphilis as the etiological factor should always be borne in mind. Massage, electricity, supports, tenotomies and muscle education usually offers relief and influence to a certain degree the existing condition.

Somerville, W. G. SUBACUTE COMBINED DEGENERATION OF CORD. [So. Med. Assoc., J. A. M. A., Dec. 6, 1919.]

There is a similarity between the nervous symptoms of subacute combined degeneration of the spinal cord and pellagra. Both diseases have in common secondary anemia, gastro-intestinal disturbances, degeneration of the posterior and lateral columns of the cord, pigmentation of nerve cells, and frequent occurrence of mental symptoms. One of the chief points of difference is the presence in pellagra of the characteristic skin lesions. The secondary anemia is common to the two, but more intense in the subacute combined degeneration, and more likely to assume a pernicious type. *Cercomonas intestinalis-hominis* has been found in the intestinal discharges of both, in every case of pellagra, according to Jelks, and in my case of subacute combined degeneration.

Bolten, H. MULTIPLE SCLEROSIS. [Med. Tijd. v. Geneesk., May 17, 1919. J. A. M. A.]

Bolten discusses the signs and symptoms of incipient multiple sclerosis as the prognosis is so important, especially at this stage. In the eight cases with an unusually early clinical picture which he reports various types are represented. In one case, a healthy man of forty fell on his knees during a fencing bout, and spastic paresis developed. By the end of the fifth month there was nystagmus, with other signs of multiple sclerosis. Bolten accepts this disease as the outcome of a congenital inferiority of the central nervous system, the same as

paralysis agitans and spastic spinal paralysis. The fact that the nervous system is below standard does not become apparent until, spontaneously or from some external factor, infection, trauma or emotional shock, the unstable balance is upset. The clinical picture then resulting may vary within a wide range. One young man presented for months symptoms of a brain tumor, including double optic neuritis, right deafness and right trigeminal phenomena, the reflexes abolished, but the pulse, mind and stomach were behaving normally. The progress of the case confirmed the diagnosis of multiple sclerosis although the roentgen findings still suggested a possible tumor as first assumed. In another case a man of fifty had presented spastic spinal paralysis for ten years before other symptoms of the multiple sclerosis became apparent. One woman of thirty-four had complained of dizziness for seven years but nothing could be found to explain it. The dizziness became worse on turning the head, lying down, and in the dark, and sometimes was so severe that she lost her balance. Finally, other symptoms of multiple sclerosis cleared up the case. In another case a man of twenty developed optic neuritis, with hyperalgesia and attacks of pain followed by briefly transient vesicular eruptions. This peculiar play of symptoms kept up for a year before the multiple sclerosis became apparent. One man of thirty with unmistakable multiple sclerosis for several years became suddenly totally blind. The papillae were blanched on both sides, but after a time vision returned and is now two thirds on both sides. The only symptoms at first in one man, now thirty-seven, were hemiparesis and nystagmus on the same side and scanning speech. When the paresis comes on gradually, as in this instance, no tendency to recovery can be anticipated.

Krabbe, Knud H. VASCULAR MEDULLARY DISEASES. [Bibliotek for Læger (Copenhagen), 1919.]

The author publishes six cases of acute medullary diseases, which are not to be considered as myelitis but rather as vascular affections, hemorrhages, thromboses or emboli of the spinal cord. The characteristics for these cases are the following:

1. They begin acutely, often apoplectic.
2. They are not preceded by fever or other signs of acute infectious disease.
3. They have no relation to any traumatic condition.
4. There are no signs of syphilitic origin.
5. The symptoms belong to one single distinct focus.
6. The cases have been cured, completely or with a slight defect.

In two of the cases the lumbar puncture has showed yellowish coloring or considerable augmentation of the albumin in the spinal fluid. These cases are probably hematomyelias. In the other cases it is more difficult to say if they have been caused by hemorrhages or thromboses. [Author's abstract.]

5. BRAIN MENINGES.

Foti. THE ETIOLOGY OF CHOREA. [*La Pediatria*, 1919, xxvii, 579-589.]

As the result of numerous careful observations Foti maintained that syphilis played an important part in the causation of chorea. This thesis met with violent opposition, especially from Fiore in Italy and Comby in France, who declared that syphilis in chorea patients was a mere coincidence and that at most it might act as a predisposing cause like all other infectious diseases, but without having any specific influence. Foti examined seventeen cases of chorea at the Naples Pediatric Clinic and found that in thirteen the Wassermann reaction was positive, in three suspicion of syphilis was justified by the family history and clinical examination, and in only one case could syphilis be excluded with certainty. Foti concludes that the almost constant existence of hereditary syphilis and chorea in his cases cannot be a mere coincidence. On the other hand, he does not feel justified in asserting that syphilis is the direct and exclusive cause of chorea, owing to the existence of cases in which syphilis can be excluded. He thinks, however, that a preponderating influence can be assigned to syphilis in the pathogeny of chorea, not as a determining cause but as the principal predisposing cause.

Stone, W. J. TREATMENT OF MENINGITIS. [*Ohio State Medical Journal*, August, 1919.]

This paper reports 259 cases of meningitis at the Base Hospital at Fort Riley, Kansas, from September, 1917, to February 7, 1919. His conclusions are as follows: Early treatment is of greatest importance. On the first day, give one intravenous injection of from 60 to 80 c.c. of serum and two intraspinal injections of from 30 to 40 c.c. each after spinal drainage of from 45 to 55 c.c. of fluid, depending on its pressure. On the second day the same amount should be given except that 80 to 100 c.c. of serum should be given intravenously and two spinal injections. On the third and fourth days repeat if necessary; on the fifth to the eighth day give one spinal injection; on the ninth and tenth days, spinal drainage only. It has been proved wise to desensitize before giving the first intravenous injection, by subcutaneous injections of 0.5 and 1 c.c. of serum. The intravenous injections should be given slowly at the rate of 1 c.c. of warm serum a minute for the first 10 or 15 c.c. If anaphylactic symptoms occur the injections should be stopped and attempted later on. One c.c. of epinephrine solution, hypodermically, will relieve symptoms of anaphylaxis should they occur; atrophine 1/100 gram is also useful for that purpose. Overtreatment may do positive harm.

Schreiber, G. S. INFLUENZAL MENINGITIS. [Paris Méd., Sept. 27, 1919. J. A. M. A.]

Schreiber comments on the fact that no one has published cases of purulent pneumococcus meningitis in the course of influenza, to his knowledge. Capitan has reported the discovery of pneumococci in the false membranes in the space around the optic chiasm, but the cerebrospinal fluid even in these cases was clear and sterile. In Rosenthal's two cases of alleged influenzal meningitis the fluid was opaline rather than purulent. Netter found a distinct cellular reaction in the spinal fluid in his three cases of influenzal serous meningitis, with recovery of two of the three patients. In his own experience, Schreiber encountered only one case of serous meningitis and the young soldier recovered after lumbar puncture. There were twenty or thirty lymphocytes in each field. From eight to ten is said by some to be a common finding in influenza as a transient meningeal reaction, but he saw it in only three cases. Influenzal meningitism occurs more frequently. The symptoms suggest meningitis, but the fluid keeps normal. Lumbar puncture thus clears up all these cases, and it is interesting to recall the "pseudo-meningitis" of the pandemic of influenza in 1890, which was before the days of lumbar puncture.

Massias, C. AN UNUSUAL CASE OF TUBERCULOUS MENINGITIS. [Gazz. Hebdom. d. Sc. Med. de Bordeaux, 1919, XL, 255.]

Tuberculous meningitis in which polymorphonuclear leucocytes predominate in the cerebrospinal fluid are not very common. C. Massias records a case, in a woman aged thirty-three, which was characterized by its rapid course simulating cerebrospinal meningitis, the almost exclusive presence of polymorphonuclear leucocytes, and the great abundance of tubercle bacilli in the spinal fluid. Death took place after four days' illness. In addition to miliary tuberculosis of the cerebral and spinal meninges the necropsy showed fibro-caseous tuberculosis of the left apex and caseous hilar glands. There was no thoracic or abdominal miliary tuberculosis.

Hassin, G. B. HISTOPATHOLOGY OF CARCINOMA OF THE CEREBRAL MENINGES. [American Archives of Neurology and Psychiatry, June, 1919, Vol. I, pp. 705-716.]

The patient, a woman forty years old, entered Cook County Hospital (Chicago) with a history of carcinoma of the left breast which was removed a year previously. About six months after the operation a solitary gland in the left axilla also was removed. Four months after the last operation severe headaches set in, with nausea, vomiting which had no relation to meals. In addition, right ptosis developed, with convergent strabismus, papilledema and numbness in the right half of the face. The spinal fluid and urinary findings were practically nega-

tive. Gastric malignancy could be excluded and a tumor was suspected. A craniotomy revealed a dura covered with numerous nodules, one of which was removed and proved to be a carcinoma. A particle from the amputated region of the breast likewise proved to be cancerous. Three weeks after the operation the patient died. The autopsy revealed among other findings metastases of carcinoma in the anterior cervical lymph glands, the right dura and pia-arachnoid. The basilar nerves, the cerebellum and the meninges covering the left hemisphere, as well as the brain tissue proper, appeared perfectly normal. The histologic examination of the affected portions of the meninges showed an infiltration with cancer cells which, in the dura, occupied the so-called dural interspaces, but spared the lacunæ, while in the pia-arachnoid they occupied the meshes, partly the Pacchionian bodies, and densely surrounded the vessels. In both, the dural interspaces and pial meshes, they usually formed large foci, separated from the walls of the interspaces and showing an abundance of fat globules. The subdural space was totally obliterated by a thick pseudo-membrane which consisted of large cancerous nodules, while the subarachnoid space was densely packed with the epithelial cells typical for carcinoma. Any reactive phenomena on the part of the dura or pia, in the form of meningitis or so-called pachymeningitis, were absent. Neither were any vascular changes present in the brain tissue proper which was totally devoid of any pathologic elements. The presence of the latter in the subdural pseudo-membrane and the subarachnoid space indicates the existence of pathways leading from the periphery to the brain, that is from the affected lymph glands of the neck, to the intracranial spaces, by which pathways the cancer cells had to travel. The most possible mode of invasion of the intracranial spaces is fully discussed, namely, the cells were carried from the lymph glands of the neck to the lymphatics, tissue spaces, perineural spaces of the cranial nerves, and thence to the subdural and subarachnoid spaces. The process of traveling of the cancer cells was by the way of a backward or retrograde current of the lymph, which was first suggested by v. Recklinghausen for explaining the metastatic origin of cancer growths in some visceral organs. The retrograde flow carries the malignant elements to the subdural and subarachnoid spaces by separate channels, as any connection between these spaces could be disproven by the fact that the enormously thickened subdural pseudo-membrane was not adherent to the underlying smooth pia-arachnoid which would have been the case if the cells had had to travel from the subdural to the subarachnoid space. The presence of cancer cells in dural interspaces speaks for a connection between them and the periphery; the presence of the cells in the Pacchionian bodies indicates that the latter drain the substance from the intracranial spaces; the absence of any cancer elements in the brain tissue or the perivascular spaces of Virchow-Robin shows that the latter as well as the

brain do not get anything from the subarachnoid space, in this case, carcinomatous elements, and finally, that the flow is from the brain to the subarachnoid space and not the reverse. The histo-pathologic studies of this case practically confirm the essential conclusions arrived at by experimental workers, like Key and Retzius, Michel, Schwalbe, Quincke, Weed and others, demonstrating as they do the great scientific value of experiments done, as it were, by nature, namely of spontaneous, not artificial, infiltration of the meninges and their spaces with substances totally foreign to them. [Author's abstract.]

Guillain, G. MENINGEAL HEMORRHAGE FOLLOWING CONCUSSION OF THE SKULL. [Arch. Méd. Belges, 72, 1919, No. 3.]

Meningeal hemorrhage following even slight contusions of the scalp is much more common than generally recognized. Thirteen examples are here reported upon. The symptoms were often extremely vague. Lumbar puncture cleared the diagnosis and aided recovery. Even a hematoma may subside under repeated lumbar puncture. Aphasia from hematoma regressed spontaneously. Local anesthesia should be used in exploring the skull, as the vasodilation resulting from general anesthesia may increase hemorrhage. Lumbar puncture, withdrawing a large amount of fluid, had better not be done at first, as the reduction in the pressure might set up a new hemorrhage. Lumbar puncture has decided therapeutic value later reducing the pressure. Symptoms which suggest meningeal hemorrhage are slight mental confusion, bilateral reversal of the plantar skin reflex, and a peculiar sallowness from the blood degeneration. Operation is inadvisable, save for severe compression symptoms and anesthetics are dangerous.

6. BRAIN: GENERAL. TRAUMA, TUMOR, ETC.

Moreira, J. INFLUENZA AND NERVOUS SYSTEM. [Arch. Bras. de Med., South American Letter, J. A. M. A., 1919.]

In this special number of the *Archivos Brasileiros de Medicina* the articles of Prof. Juliano Moreira on psychical disturbances determined by influenza and on influenza in the lunatic asylum during last November and its influence on mental diseases are worthy of special notice. Dr. Moreira's opinion is that the mental disturbances he noted, most of them benign, were due to the influenza virus or its toxin. Among other manifestations, the grip provoked meningitis, pseudomeningitis and encephalitis. No case of paralytic dementia resulting from influenza was observed, although latent cases manifested themselves following influenza. Sixty per cent. of influenza psychoses resulted in recovery. Out of 1,470 patients of the asylum, 1,314 were stricken with the disease during the second half of October, and ninety-two, or 6.3 per cent., succumbed. During the same period, 160 new patients suffering with mental diseases due to the pandemic were interned, and in

the first days of November, 114. Dr. Moreira did not observe any instance of remission in cases of paralytic dementia; on the contrary, he observed the exacerbation of the symptoms of patients suffering with diffuse latent meningoencephalitis.

Wilson, Wm. HEADACHE. [Practitioner, October, 1919.]

The writer, in a clear and elementary article, says that a classification of headaches according to their causes is very difficult, but propounds the following to include the commoner conditions: 1. Auto-intoxicant: Gouty, rheumatic, hepatic, nephritic, intestinal; specific infectious diseases; menstrual and climacteric; disorders of the ductless glands, like the thyroid and pituitary. 2. Circulatory: Anemias, arteriosclerosis, plethora, cardiac disease, deficient coagulability of the blood. 3. Extraintoxicant: Poisons generally, like alcohol, tobacco, opium, and lead. 4. Neurogenous: Neuroses, neurasthenia, true migraine. 5. Reflex: Ocular, nasal, aural, pharyngeal, dental, visceral, genital, chiefly uterus and ovary. 6. Local organic disease, as of the brain and its coverings. 7. Variation in the tension of the cerebrospinal fluid; Serous meningitis cerebral edema. Of the chronic headaches, the most unbearable are those of brain tumor, brain syphilis, and arteriosclerosis. Always suspect congenital syphilis as a cause of persistent and severe headaches, which are worse at night, in a child.

In investigating a case of headache we should note: 1. Whether it is unilateral or bilateral. The presumption in the former case is in favor of a unilateral cause, in the latter of a general cause, but not necessarily so. 2. The locality of the pain. 3. Any local tenderness and whether superficial or deep. 4. Whether it is constant, intermittent, or remittent. 5. The diurnal incidence and variation. 6. The character of the pain, whether paroxysmal, throbbing, boring, dragging, feeling of tension or the reverse, aching, or feeling of pressure on the head. 7. Whether it is produced or aggravated by any position of the body or by movement. 8. Is there any complaint by the patient of any organ of the body, or is there any systemic fault, *e.g.*, anemia or other blood condition, pathological condition of the urine, dyspepsia, constipation, rheumatism, syphilis, or malarial history. The writer considers all these things in detail, with a little extra attention to headaches of nasal origin.

Nordentoft, S. RADIOTHERAPY OF BRAIN TUMORS. [Jour. de Radiologie, Vol. 3, No. 7.]

Eighteen cases of brain tumors were given roentgen ray treatment between February, 1915, and the present time. Nine of the patients are alive and in good health, with the exception of one case of hemianopsia, and one of poor vision in a case that had been almost blind before the therapy. Two striking cases are here described, one that

of a young lawyer who became imbecile, with incontinence of stools and urine. The tumor, presumably a diffuse glioma in the frontal lobe, could not be localized. The entire head was submitted to cross-fire exposures of all regions except the occiput which was too difficult to reach. The aluminum filter had a thickness of 10 cm.; rays were applied until depilation was complete. Improvement was apparent in five or six days, and recovery was soon complete. Two cases of cerebellar tumor responded to the therapy; a third case died, and a fourth did not improve, although the course of the tumor was arrested. A later operation revealed a cyst in the cerebellum, with complete recovery after drainage of the cyst. This cyst may have been developed in the space left by the healing of the tumor under the treatment.

Lashley, K. S., and Franz, S. I. CEREBRAL FUNCTION IN PARTIALLY DECEREBRATED RATS. [Psychobiology, Vol. 1, No. 2.]

Various parts of the cerebral cortex, including frontal, temporal, parietal and a large portion of the orbital surfaces were destroyed in rats who were afterwards trained, and ability of forming and retaining kinesthetic motor habits tested. With any part or all of the cortex lying in front of and above the knee of the corpus callosum destroyed, as well as any part of the temporal and parietal regions, the rats were able to turn correctly in a simple maze. The maze habit was acquired after destruction of all the cortex, and one, or possibly both of striate nuclei. The inclined plane box habit was lost on complete destruction of the frontal regions of the cortex, but with partial destruction, or destruction of the temporal regions, was still retained. The retention of the habit seemed to be determined by the preservation of any part of the frontal pole, regardless of what part has been destroyed. Hemiparesis appeared as a result of destruction of the corpus striatum, but complete destruction of the stimuable areas of the cortex did not seem to cause any motor disturbances.

Borries, G. V. T. LUMBAR PUNCTURE WITH ABSCESS IN BRAIN. [Hospitaltidende, Vol. 62, No. 25.]

Four types of cerebrospinal fluid at lumbar puncture with suppurative cerebral and subdural processes are demonstrated. When the abscess is free from complications the fluid may be clear. Respiratory paralysis as a result of the suppurative process may prove fatal, and the lumbar fluid still show no signs of pleocytosis. Turbid fluid indicates irritation, and not necessarily eruption of pus, as the fluid may be sterile, the leptomeningitis may not be perceptible to the naked eye. In cases that succumb to cerebral lesion, even, the leptomeningitis may never have passed beyond the microscopic stage. The lumbar puncture fluid enables one to distinguish between an uncomplicated diffuse leptomeningitis process in the brain. We may assume a brain abscess

free from complications; its characteristics are those of a benign course. The symptoms from the brain abscess may grow more severe while the spinal fluid is clearing up. Hitherto no one has thought of using this factor to distinguish between an abscess and meningitis. Borries cites cases from literature and his own practice in support of this observation, and points out that the results of a single lumbar puncture are apt to be misleading.

Tapie, J., and Cassar, A. MYELOID LEUKEMIA WITH HEMIPLEGIA OF HERPES ZOSTER. [Arch. d. Mal. d. Cœur, May, 1919.]

Nervous affections as complications of leukemia in the form of cerebral hemorrhage, convulsions, facial paralysis, and symptoms from pressure on nerves by lymphomas are noted in two cases presented by Tapie and Cassar. In addition to this there was occipitofacial herpes zoster in a man of fifty-seven. Complete hemiplegia with fatal leukemia occurred in the second case, that of a younger man.

Ogdon, R., and Franz, S. CEREBRAL MOTOR CONTROL. [Psychobiology, Vol. 1, No. 1.]

Hemiplegia artificially produced in four animals was treated by various methods to determine conditions favoring voluntary motor recovery. If the animal is left to its own devices experiment shows that motor recovery after production of hemiplegia does not come about. There is little improvement in cases where the animal is prevented from moving the unparalyzed segments, or when no treatment is given, aside from extra stimulation of the muscles and nerves on the paralyzed side. Recovery is rapid when treatment by muscle stimulation and nerve vibration is directed to the parts involved and when special exercises to provoke the animal to move the paralyzed segments are given. General massage, the treatment recommended by neurologists, produces a slight improvement but not to the extent of enabling the animal to use the arm and hand for the ordinary operations of feeding and climbing; the activities may be carried out awkwardly, however, after treatment. When efforts are directed to the special nerves and muscles, and when the sound side of the animal is restrained so that climbing and feeding movements must be made by the use of paralyzed segments if they are to be made at all, improvement is rapid and recovery practically complete. A fact of interest is that recovery from the hemiplegic state may be very rapid. The results of these experiments suggest a reconsideration of the whole problem of cerebral motor control, especially that of cortical motor control.

Abrahamsen, H. TREATMENT OF SPASTIC HEMIPLEGIA. [Ugeskrift for Laeger, Copenhagen, Aug. 7, 1919, Vol. 81, No. 32.]

A review of spastic hemiplegia in general is followed by a descrip-

tion of a clinical case resulting from a stab wound in the neck. Severe localized spasm was present, without actual contracture. Medical measures were unavailing, so Abrahamsen decided to lessen the reflexes and tried systematic muscle exercises. Half of each innervating branch of the muscles involved was resected. The nerves were reached through the popliteal space and the inguinal region. In the arm half of the median nerve was resected. There was no difficulty in getting at the nerves, and all the spastic phenomena disappeared with the exception of a slight foot-lift on stepping.

Salomonson, Wertheim, J. K. SOFTENING OF THE BRAIN AND CEREBRAL HEMORRHAGE. [Ned. Tijdsch. f. Genees., May 31, 1919.]

Food shortage and restrictions in certain types of food has been associated with a decrease in male cases of cerebral hemorrhage and a four-fold increase in softening of the brain. The statistics for seven years show forty-six cases of softening to thirty-eight of cerebral hemorrhage; the first four years, however, show a total of only fourteen to twenty-one. Bread cards, introduced in 1915, and potato cards, 1916 were soon followed by restrictions in fat and meat; with the lowest point in rations reached at the end of 1918. The following phenomena were observed: a general loss of weight was followed by a decline in blood pressure. The pulse rate dropped to forty or fifty or even less in the morning. Blood pressure was variously reported from 7 or 8 cm. mercury, to Schlittenhelm's note of 4 and 5 cm. Weakening of the heart sounds at the base was a further phenomenon. The decline in blood pressure was not limited to elderly individuals with pathologic vessels. Thus the circulation was below par in all. In some pathologic arterioles circulation was known to die out completely, with resulting arteriothrombosis, which, when occurring in a cerebral artery, produces a focus of softening. Some of the smaller vessels are deprived of their full supply of nourishment on account of the low pressure and the reduced pumping power of the heart. The vasa vasorum suffer especially. Thus the increase in cases of softening of the brain, and the decrease in apoplexy is not a chance coincidence. Salomonson considers that the prognosis is more favorable with the former than with the latter, and reports that most of the cases of encephalomalacia improved markedly under medical treatment.

Dugeon, L. S., and Clarke, C. FATAL CASES OF PERNICIOUS MALARIA. [Quart. Jl. Med., July, 1919.]

Massing of malarial parasites in the cerebral capillaries was observed in twenty-one cases where the patient died in coma. In twelve cases gradual onset of the cerebral symptoms of drowsiness, mild delirium, apathy, and restlessness was noted. The remainder were already deeply comatose when first seen and previous history was un-

available. Treatment by quinin, intramuscularly or intravenously, usually both, was applied at once. Twelve cases terminated fatally within twenty-four hours. One case terminated in six hours, while two cases lingered for sixty hours. Temperature, when recorded, was always raised from 100° to 105° F. Capillaries and, in severe cases, the arterioles were engorged with infected red blood cells collected at the periphery of the vessels. Prominent and detached endothelial cells, melanin particles, and free parasites, were numerous. The crescent phase of development was not seen, although "dot" forms, fine rings and segmenting forms were present. All degrees of blocking to complete thrombosis with agglutination of the corpuscles and altered staining reactions were observed. Hemorrhages around the smaller blood vessels was met with occasionally, the rupture of vessels in one case having made possible the discharge of parasites into the tissues. This was not usual in rupture of the cerebral capillaries or capillaries in other viscera. The vessels were filled with infected red cells, or in some cases the red cells were seen closely packed about the vessel walls. No infected red cells were to be found in the hemorrhagic zone. The lining endothelial cells showed pigment, in detached phagocytes and free in the lumen. Eleven cases showed nerve cell degeneration, evidenced in abnormalities, loss of Nissl granules, and distortions. In one case where paraplegic symptoms had developed before death the spinal cord showed advanced cell degeneration of the anterior horn cells with typical vascular changes and complete vessels blocking. The spleen, marrow, heart and pancreas showed local accumulations most frequently, the intestines, lungs and suprarenals less frequently. In the liver, kidney and thyroid these accumulations were only occasionally met with. Other conditions recorded were fatty and other degenerations of the cardiac muscles, acute tubal "nephritis," vascular changes in the suprarenals, with tissue necrosis, pulmonary congestion and hemorrhage.

7. NEUROSYPHILIS.

Mehrtens, G. H. THERAPEUTIC MENINGEAL IRRITATION IN NEUROSYPHILIS. [*Am. Arch. Neur. and Psych.*, Oct., 1919.]

Experiments were undertaken to find out if the normal penetration of arsenic into the spinal fluid could be increased by an irritation of the meninges such as must occur in all of the intradural treatments. It was found that irritation of the meninges by intradural injection of the patient's own serum caused a cellular reaction ranging from 100 to 2,300 cells per cubic millimeter of spinal fluid. Simple intravenous injection of 0.6 gm. arsphenamine resulted in a positive test for arsenic in the spinal fluid in 43 per cent. of the cases examined. Complete drainage of the spinal fluid did not increase the number of arsenic penetrations. Intravenous injection of arsphenamine, six hours after meningeal irritation, gave 92 per cent. penetrations, and compared with controls gave three times as strong an average concentration of arsenic.

It would seem that the foregoing results could be applied to the treatment of neurosyphilitics in the following way: (1) Every case should have the benefit of intensive intravenous medication until it is certain that the case belongs among those with impermeable membranes. (2) It would also suggest that for the cases resistant to ordinary therapy, in order to obtain the maximum concentration of arsenic in the spinal fluid, the patient's own blood serum should be injected into the subarachnoid space six hours before the arsphenamine is given intravenously. This serum may be injected as in the Swift Ellis technic, or if necessary, arsenic or mercury may be added according to the Ogilvie or Byrnes technic. This procedure is not more complicated than either of the intradural methods, and has the definite advantage of allowing arsenic to pass from the blood to the spinal fluid in greatly increased concentration. [Author's abstract.]

Mackenzie, Joseph. SYPHILIS OF THE NERVOUS SYSTEM AND ITS TREATMENT. [Glasgow Medical Journal, July, 1919.]

Mackenzie says that gummata, or syphilitic granulomata, may develop in practically any part of the syphilitic subject. In the central nervous system this manifestation of the disease may occur in a variety of forms. In the first place, it may be present in the form of a large tumorlike mass, commencing either in the membranes of the nervous system or in the substance of the brain itself. The symptoms to which it gives rise are those of tumor, but the gumma may be only one or two or more different expressions of infection, and in that case the symptoms may be, and usually are, complicated by those disturbances which depend upon the other manifestations of the disease. For example, one sometimes finds a gumma in a case of general paralysis, or in a case of locomotor ataxia, and in such conditions clinical phenomena of a mixed character would be observed. These gummata, which may be single or occasionally multiple, give rise to progressive symptoms of pressure, which, according to the site of the growth, produce different localizing symptoms. They yield readily to treatment, if treatment has been begun before the pressure effects have produced permanent damage to the important brain structures. They occur in the congenital as well as in the acquired form of the disease, and, as a rule, make their appearance after the second year of its development. Then, again, the gummata may be miliary; that is to say, they may be present in large numbers and dispersed all over the surface of the brain, like miliary tubercles, or scattered here and there along the lines of the main vessels in the substance of the brain. The miliary form of gummatous infiltration occurs late in the disease, and is usually noted for the first time at postmortem, or at a stage when effective treatment is no longer possible. Mackenzie has seen three cases of this type at postmortem, and in each of these, in addition to the miliary gummata, there had

been a diffuse infiltration of brain substance, giving rise to a destruction of neurones and vessels, and resembling in some respects the anatomical degeneration seen in general paralysis of the insane. In one of these cases salvarsan was administered without effect. The cerebrospinal fluid contained a large amount of globulin and a large number of lymphocytes. The patients had been gradually losing the power of their legs, but had not shown those symptoms of alienation or progressive dementia which are characteristic of advanced general paralysis.

Castex, M. R. A SIGN OF LATE HEREDITARY SYPHILIS. [Prens. Med. Arg., Jan. 20, 1919.]

This sign consists in a bifid condition of the spine of the first lumbar vertebra. The bifurcation may be slight or very marked and involve two or three lumbar spines. In one case it was found in the spine of the twelfth dorsal vertebra. The sign is not very frequent, being found roughly in 30 to 35 per cent. of cases of late inherited syphilis. Castex, however, attributes considerable diagnostic value to its presence, as it may exist alone or be associated with only a very small number of other stigmata of inherited syphilis.

Frothingham, C. LATE SYPHILIS OF THE CENTRAL NERVOUS SYSTEM. [American Journal of the Medical Sciences, September, 1919.]

This author shows that it is possible to overlook syphilitic involvement of the central nervous system in an ordinary careful history taking and physical examination as completed in the wards of a general hospital, even when syphilis is known to exist. This possibility of error must be magnified outside the hospital. The study of the spinal fluid will readily give evidence of syphilis of the central nervous system when symptoms and physical signs are not obtained on careful routine examination. As the procedure of lumbar puncture, although somewhat time consuming to the patient, is practically without danger; as it opens up a means of diagnosing late syphilis of the central nervous system when other diagnostic means fail, and as late syphilis of the central nervous system calls for special form of treatment, it is recommended that in all cases of old syphilis a lumbar puncture should be performed as a diagnostic procedure before instituting treatment.

Goodwin, G. M. NEUROSYPHILIS AND ARSPHENAMIN. [Amer. Arch. of Neur. and Psych., Vol. 2, No. 1.]

In this series of twenty-one cases, 214 intraspinal treatments were given by Goodwin and Scott. Severe reactions have occurred, but no permanent injury or ill effects resulted from the intraspinal use of auto-arsphenamized serum. The treatment has uniformly been of benefit in its effect of increasing the patients' comfort by lessening the severity and frequency of their pains, in frequently improving bladder

control, and in improving their nutrition. Improvement in station and in gait has frequently been observed in these cases, and in some, to a very marked extent. [Author's abstract.]

Booth, David S. SYPHILIS AS AN ETIOLOGICAL FACTOR IN EPILEPSY. [Journal Missouri State Medical Society, November, 1919, Vol. XVI.]

The author prefaces his thesis by defining epilepsy on the basis of an entity, though calling attention to the fact that it is but a syndrome resulting from many and various conditions, some known and discoverable by a thorough and complete clinical and laboratory examination; others unknown and not discoverable even post mortem by any means yet known—so-called idiopathic epilepsy. The author recalls that there is a variation between different observers as to the frequency of syphilis as an etiological factor in epilepsy, at least to the degree that it is the sole cause, which is often difficult, and at times impossible, to demonstrate. Though generally recognized that epilepsy may be caused by various tangible syphilitic manifestations, most authors do not mention the possibility of syphilis causing a "basic impairment of the germ plasm" without pathological findings, however, it appears evident that there must be a peculiar condition of the nervous system, inherited or acquired, that enables an irritant, whether toxic or otherwise, to produce stereotyped attacks in certain individuals and not in all having a similar existing factor. Many textbooks merely refer to syphilis as one of the causes of epileptic attacks without any reference as to its frequency or the manner in which it acts.

Available statistics give syphilis as infrequent in epileptics, from five to fourteen per cent., while reports of most serologists give a small percentage of positive Wassermann reactions in both the blood and spinal fluid, with variable and inconsistent findings in the latter as to pressure pleocytosis and globulin content, though frequently there is a considerable deviation from the normal reaction of the Lange colloidal gold test.

If it is possible for syphilis to be present in an epileptic without giving any diagnostic evidence, it may be argued that the disease should at any rate respond to antiluetic treatment, which is untenable, since a disease or condition is not necessarily cured by treatment directed to the cause; hence, the fact that symptoms presumably due to a frank syphilis do not recover after all clinical and serological evidence of syphilis has disappeared does not necessarily argue against a syphilitic origin.

Another source of error arises from depending too much upon the laboratory findings and too little upon the findings of a critical clinical examination.

Though some of the author's cases of epilepsy have shown only

a two plus Wassermann and a few but a one plus reaction, he is treating them as though specific in origin with encouraging results, though it is too early to record conclusions. Those giving a one plus Wassermann have been almost entirely children or women in whom he had reason to believe that if syphilis were present at all, it was hereditary. While unprepared at this time to give data, the author is able to state that in his experience of the past several years the proportion of epileptics giving a Wassermann reaction in some degrees is much greater than that given in available statistics and he feels confident that the laboratory has not detected all cases in which syphilis was, either directly or indirectly, an etiological factor. [Author's abstract.]

With, Carl. CEREBROSPINAL FLUID IN SYPHILIS. [Brain, 40, 1918, Parts II and III.]

In introduction the advantage of the globulin and albumin reactions with Bisgaard's technic, compared to that of Nonne is emphasized. The method just used by Ross and Jones and independently of them by Bisgaard applied to big material, is termed Bisgaard-Ross-Jones test (B. R. J.). In the test I always use a black box; to sharpen the sight the transverse slit in front is mounted with a funnel-shaped tube. At a fixed distance above the opening at the top an electric lamp is placed a piece of black cloth, some pipettes and glass tubes, 13 cm. long and one broad are needed. One c.c. fluid and 1 c.c. reagent used; latter run to bottom of fluid, diluted with a solution of 0.9 per cent. NaCl. The nitric acid should have a specific gravity of 1.8. Solution of chemically pure $(\text{NH}_4)_2\text{SO}_4$ (80 grams shaken with 100 grams water and warm to 70° C. half an hour) must be completely saturated and should have a neutral reaction. If the nitric acid test is just positive, when we use a dilution of c.s.f., one in ten, we get the "phase" 2 equal 1. If a ring is just obtained after three minutes in the ammonium sulphate test "phase" 1 equals 1. B. R. J. then recorded (1-10).

In forty-four control cases number of 0-4 cells found normal, 4-10 suspect and more than 10 pathological. Ammonium-sulphate value generally one or less, but sometimes as high as two, while the acid-nitric value is generally fifteen or less, fairly often twenty, and in a few instances twenty-five.

In cases of cerebrospinal tumor B. R. J. was not different from that of nervous syphilis.

In eighty-two cases of primary syphilis one of the reactions found positive six times. The value of terms primary and secondary syphilis discussed; patients with venereal ulcers should always be regarded as suspected of syphilis even if the W. R. is not positive and although no syphilitic rash appears. It is suggested that the venereal ulcers in a similar way as the gangrenous ulceration may be able to retard and eventually suppress the development of the syphilis.

In fifteen of 134 cases of untreated secondary syphilis at least one of the reactions was positive. As twenty of twenty-four untreated cases of leucoderma and sixteen of thirty-nine treated and untreated cases showed more or less gross pathological reaction, it is suggested that there is a definite connection between pigmentary syphilis and diseases of the spinal cord.

The number of reactions in latent syphilis (101 cases), in syphilis congenita rectus (seven cases), syphilis congenita tarda (twenty-seven cases) and tertiary syphilis (eighteen cases) are discussed. The number and nature of the reactions are considered in fifteen cases S. II nervosa, twenty-two of S. III nervosa, twenty cases of dementia paretica and twenty cases of tabes dorsalis. The relation between the two fractions in B. R. J. was found identical in ordinary nervous syphilis and dementia paretica. Fildes and McIntosh's view that the reactions of the cerebrospinal fluids vary according to the site of lesion was confirmed. The hypothesis, that a positive Wassermann reaction in untreated cerebrospinal fluid may be found in tuberculous meningitis is set forth. In the fourth chapter, the influence of the antisyphilitic treatment upon the various reactions is discussed. It is shown that the various reactions are most favorably influenced in cases of early syphilis without manifest nervous syphilis; the reactions in cases of secondary and tertiary syphilis of the nervous system are fairly well influenced; the reactions in dementia paretica and tabes dorsalis may in cases be influenced by the antisyphilitic treatment, though rather slowly. The fluctuations of the reactions in the fluid were studied in an interesting case; the result of the twenty-seven lumbar punctures in about three years is illustrated on Table VII. [Author's abstract.]

With, Carl. ON THE REACTIONS ON PORGES, HERMAN AND PERUTZ IN THE CEREBROSPINAL FLUID. [Hospitalstidende, No. 16, 1914, pp. 481-486.]

The summary reads: A positive Herman and Perutz reaction in a cerebrospinal fluid, which had been heated above 55° C., is probably a sign of syphilis, but the reaction is less sensitive than the Wassermann reaction. In unheated fluid the reaction is only found together with a pleocytosis. About one hundred cases of syphilis were examined. [Author's abstract.]

With, Carl. STUDIES ON THE PANDY'S REACTION IN THE CEREBROSPINAL FLUID, ON THE INCONVENIENCES BY AS WELL AS THE INDICATIONS OF THE LUMBAR PUNCTURE IN SYPHILIS. [Ugesk. f. Laeger, No. 32, 1916, pp. 1353-70.]

I. *On the Pandy's Reaction.*—The reagent is a concentrated solution of carbolic acid, which according to Talosicki is made by a mixture of phenol liquid purissimum (80-100 cm.) which is shaken with about a

liter distilled water and placed in the thermostat for some hours. The fluid is conserved for some days; the thinner upper portion is poured out and used as reagent. The reagent is put in a watch-glass; by a Pasteur's pipette a small drop of the cerebrospinal fluid is carried to the bottom of the glass; if no precipitation is seen after five seconds the reaction is considered negative; all transitions are found between a cloudy precipitation and a very voluminous one. This test was applied in 225 cases and compared to the Bisgaard-Ross-Jones reaction. The reaction is far from being of the same value as the B. R. J., but as it practically does not take any time it is worth while to use before the B. R. F. J. When only 1-4 cells are found and the Pandy reaction is negative, it is extremely seldom that the W. R. J. and the W. R. Sp. is positive. I wrote in the summary: "A wanting Pandy's reaction makes it probable but not certain that the B. R. J. is normal, while a positive Pandy's reaction in 15 per cent. of the cases is found together with a normal B. R. J."

II. *On the Inconveniences of the Lumbar Puncture.*—The summary reads: By lumbar puncture in 490 cases without symptoms from the central nervous system we got rather severe troubles (headache, nausea and vomiting as well as vertigo) in 28 per cent. These symptoms were more pronounced, when a greater amount of fluid was poured out, and more troublesome, when the patients were not hospitalized. In 121 cases of nervous symptoms the troubles were generally less pronounced; on the other side they were well marked in the neurasthenics. A lumbar puncture ought not to be done the same day as an injection of salvarsan is given.

III. *On the Indications of Lumbar Puncture Especially in Syphilis.*—The conclusion reads: The cerebrospinal fluid ought to be examined in all syphilitics, treated in hospitals. [Author's abstract.]

With, Carl. THE INTRASPINAL SALVARSANTHERAPY. [Ugesk. f. Laeger, No. 33, 1917, pp. 1607-13.]

A short review of the literature together with the description of a single case of dementia paretica, in which intraspinal injection of neo-salvarsan in distilled water were used. The patient got five injections; after the second injection of 6 milligrams there was involuntary discharge of the urine; the next injection of 7.5 mg. did not trouble him, but a week after the last injection of 9 mg. the sphincter troubles set in once more and the paresis became much aggravated. [Author's abstract.]

Galliot, U. TABES AND INHERITED SYPHILIS. [Paris Méd., June 7, 1919. J. A. M. A.]

In Galliot's two cases the inherited syphilis had been absolutely mute in one; the tabes developed at twenty-nine and thirty-six. The uneven

pupils in one case had been noted from childhood but vision was normal; under treatment of the tabes the pupils became symmetrical. In both, the tabes developed under the stress of the campaign.

III. NEUROSES; PSYCHONEUROSES; PSYCHOSES

1. NEUROSES AND PSYCHONEUROSES.

Richards, Esther Loring. A STUDY OF THE INVALID REACTION. [*Archives of Neurology and Psychiatry*, Vol. 2, No. 4, October, 1919.]

No class of patients inflicts so much strain on the time, patience and medical wisdom of the general practitioner and the specialist as hypochondriacal individuals; and no class of patients suffers more at the hands of the professor than do these unfortunate members of society. The helplessness of efforts to serve this body of ailing human beings seems due to a persistence in our thinking of what Adolf Meyer has called "the medically useless contrast of mental and physical." According to the pioneers in "neurasthenia" there was a physical basis not only for all its somatic symptoms, but also for its "psychic" manifestations which were elastic enough to include every reaction except outspoken major psychoses and organic brain disease. This physical basis was faulty nutrition of the nerve cells with resulting increased fatigability of the nerves per se. Later Janet and Freud invented ingenious psychological explanations to account for the "psychic" expressions of "neurasthenia." In studying the sixty cases of invalidism presented in this paper the writer has had but one idea, and that is to approach each case as a problem by itself, to describe faithfully the facts which it presents, and to study them for the purpose of ascertaining what they mean in the patient's life. In what setting of life experiences and constitutional makeup, as well as biological activities, do they occur? What opportunities for modification do they offer, not only from the standpoint of the individual's metabolism and hygiene, but also from the standpoint of his constructive constitutional assets, his adaptive resources, his material for instinctive readjustments? With this aim in view it becomes useless to haggle over what symptoms should be charged up to mind and what symptoms charged to body.

Fifteen of the sixty cases refused to remain for treatment when told that their exclusive salvation did not lie in a continuance of drug and operative therapy. Of the forty-five patients treated sixteen were discharged as "well" and have remained so; twenty-five were discharged as "improved," and four as "unimproved." It was not possible to trace eleven of the "improved," but of the remaining fourteen, six are completely well, four are back at work in spite of a few complaints, and four have relapsed into their former invalidism. As to the "unimproved," two are well, one is at another hospital, and one is untraced. The ages of the entire group vary from twenty to seventy-

two years. The proportion of females to males is three to one. The average duration of symptoms is five years; the average length of their stay in the clinic is twelve weeks.

Symptoms.—Their complaints included headache, dizziness, general weakness, nausea, eructation, insomnia, anorexia, etc.

Examination.—Every patient was subjected to routine examinations as follows: A general physical examination including a neurological status, an examination of the reproductive apparatus together with laboratory studies of the urine, blood, etc. (blood Wassermann). These inquiries were supplemented by consultation with other hospital clinics such as the dental, roentgen ray, electrocardiographic, etc., and by such special investigations as gastric analyses, blood-sugar determinations, blood cultures, etc., according as the facts of the routine examinations or the patient's complaints indicated further research. The psychopathologic data were derived from a record of the individual's mental status, and a study of the facts of his growth and development from childhood with particular emphasis on the constitutional makeup and reaction tendencies.

Method of Treatment.—The patient was given a frank report of the various examinations, and invited to think of his incapacitations, not as a disturbance in functioning of some point of visceral strategy from which his symptoms seemed falsely to emanate, but to think of his symptoms as substitutes for reactions to unhappy experiences, thwarted ambitions, petty jealousies, romantic disappointments, an empty and dissatisfied life, a desire to escape marital or domestic responsibilities, etc. Along with education in this concept he was given the benefit of any hygienic lifts suggested by the various examinations, such as attention to the weight curve, hemoglobin, eyestrain, etc. Together with the physician's conscientious survey of the facts of each case was a ward routine arranged so that the patient got a full and well-ordered day with gymnasium, occupation class, recreation, and leisure for reading, writing letters, etc. It has been found that these concrete activities not only form a sort of natural bridge between the self-limitations of the invalidism and the return to normal action and interests toward which the patient is headed, but they also restore confidence in his somatic capabilities in general, and especially in certain viscera against which he has so long nursed suspicions of incompetence. He learns that he can eat proteins, carbohydrates and fats without disaster, that he can use his eyes without headaches; and can exercise without fatigue.

In the chart accompanying this study each record covers the patient's age, sex, complaint and its duration, previous treatment, somatic condition, constitutional makeup, psychogenic material, condition on discharge and catamnestic data. The following is a brief case sketch:

No. 18 was a single woman of thirty-three who since 1904 had suffered from diffuse headaches accompanied by nausea, vomiting, and frequently "falling spells" without loss of consciousness. In 1911 she

had to give up work and from that time on had lived the life of a recluse. She had been treated for epilepsy without improvement.

On admission the physical, neurological and laboratory examinations were negative.

The patient was a bed-wetter till six years, and was a timid, self-conscious child. She had a narrow, rigid home environment where every normal instinct for recreation, social outlets and the expression of her individuality was repressed by a domineering mother. She reacted to this atmosphere with a feeling of inferiority. She shrank from meeting people, feared to take responsibility and suppressed all interest in the opposite sex. At first headache and "falling spells" followed some exceptional physical or emotional strain, but from 1910 they occurred irrespective of any unusual event, seeming to represent her only means of getting square with an intolerable home situation.

In discussing matters with her the patient was told that her complaints were the expression of her inner conflicts and dissatisfactions, and that the solicitude and sympathy called forth by her affliction satisfied her natural craving for affection and the expression of her individuality. She was urged to reach out toward new outlets in the cultivation of friends, social interests, recreation and occupation. Since discharge three years ago the patient has had no "falling spells," and but seven or eight headaches a year, none of which have been severe enough to keep her from an eight-hour day where she is employed. [Author's abstract.]

Major, Hermon S. WORK OF NEUROPSYCHIATRISTS IN U. S. ARMY CAMPS. [The Journal of The Missouri State Medical Association, Vol. XVI, No. 11, page 377.]

The author states that when the United States first entered the war our position regarding neuropsychiatric examination of recruits was about the same as that of England and France at the time of their entrance into the war, and consequently our first contingent of troops which were sent over seas had not been subjected to a special examination along that line.

It seemed to be a prevailing idea in the beginning of the war that if a fellow didn't have sense enough to make a living or wasn't good for anything at home he should by all means be sent into army service, thereby losing sight of the fact that a soldier to be successful and able to undergo hardships, must be sound from a neuropsychiatric standpoint as well as physically. However, as time went on the local boards became more critical, as was shown by statistics from the neuropsychiatric board at Camp Pike, Arkansas, in which there was a steady decrease of rejections from May 7 to September 21, 1918, ranging from 2.02 to .54 per cent. While his paper has dealt more particularly with the work of the neuropsychiatrists in connection with the examination of recruits,

the author states that he is not unmindful of the efficient service rendered by our neuropsychiatrists in the base hospitals both at home and abroad and their persistent and scientific efforts in restoring the unfortunates to health and usefulness.

He suggests that it would be well for us to continue in civil life the careful neuropsychiatric examinations which were practiced in the army, as doubtless a great many nervous and mental cases would be recognized much earlier, with a correspondingly more favorable prognosis as regards the care and treatment. [Author's abstract.]

Rhein, J. H. W. WAR NEUROSES. [N. Y. Med. Jl., Aug. 2, 1919.]

John H. W. Rhein observes that the war neuroses seen among the American forces present some features differing to a certain extent from those seen in the armies of England and France. He divides the patients coming into neurological hospitals at the front for the most part into: (1) Those in whom there have already developed hysterical phenomena, such as aphonia, deafness, blindness, palsies of the limbs, amnesias, and confusional mental states. (2) Those who have well-defined anxiety states. (3) Neurasthenias. (4) Psychasthenias. (5) Those who are best described as examples of hyperemotivity. Besides these there are a small number of soldiers suffering from actual psychoses, a few from organic nervous diseases, epilepsy, mental deficiency, and, finally, a number of cases showing transient symptoms which have the coloring of psychoses from which the patients speedily recover and follow a similar course to the war neuroses generally. The states described by the soldier as periods of unconsciousness, the writer views as hysterical phenomena, pure and simple. They consist of faints, confused states, or amnesias. There is also a group of cases which show practically no symptoms after a few days' rest except a mental attitude toward line work and a history of definite, unnerving reaction to shelling. These the writer looks upon as instances of what he has termed hyperemotivity. Soldiers belonging to this class are unable to carry on under shell fire; they feel weak, dizzy, tremble, cry, and are afraid. Upon the arrival of such a patient at the hospital he presents few symptoms. Over 60 per cent. of the patients coming into the neurological hospital were restored within an average of ten to fourteen days to a state of apparent nervous stability. The method employed to bring about these results consisted in explaining to the soldier in the receiving ward, before he was actually admitted to the hospital, the exact nature of his condition, and in reassuring him as to the prognosis. Almost immediately there was a relaxation of tension from which nearly all the patients suffered, and the soldier experienced an enormous relief from the anxiety of the situation in which he found himself. He was bathed, fed, and put to bed, whereupon he usually fell into a profound slumber which lasted from thirty-six to forty-eight hours. He was

then examined by the war psychiatrist, who explained to him the mechanism of the condition and treated him by suggestion. The patient was next interviewed by the commanding officer, who went over his history, and again explained the nature of his symptoms in a way that robbed them of horror and mystery which surrounded them, and he also gave reassuring suggestions. (After a brief rest period, usually three to five days, all the patients were put on a schedule consisting of rest periods, graduated exercises, hikes, periods of recreation, games, and group singing, which occupied the entire day. In twelve to fourteen days from 60 to 70 per cent. were again fit for line duty. In the base hospital, however, one found a different picture. Hysterical manifestations were observed, stammering spread through a ward, mutism appeared, some paralyses, more rarely gait disturbances, and amnesias appeared. This made it seem that these men had acquired a state of suggestibility which permitted a return to a fairly normal state rapidly when properly treated, and, on the contrary, if allowed to be exposed to contagion and pernicious suggestion, the development of hysterical phenomena and anxiety states was favored. While the writer believes that it goes without saying that a man with a previous history of unstable nervous system is more susceptible to the experiences of battle there were many who presented symptoms in whom there was no such history. They acquired in short time a state of instability which in civil life would take months or years to develop. In 320 histories, 174 were negative as to previous nervous manifestation. In 146 there was a history of nervousness, nervous breakdown, nervous temperament, chorea, fear of the sight of blood, phobias, traumatic neurasthenia, bed-wetting, sunstroke, delinquency, dizzy and fainting spells, hysteria, and drug addiction. Previous occupation played some part in rendering a person susceptible to the influences causing neuroses. In 327 case histories there were forty-six farmers, thirty-eight clerks, thirty laborers, eighty-five skilled laborers of various types, and four physicians. Family predisposition was observed in a certain number of cases. It was negative in 195 cases, and positive in 137 as to insanity, cancer, tuberculosis, or nervous manifestation in father, mother, sister, or brother. In a small number of cases there was a psychotic reaction resembling dementia præcox. The reason one found this variety of reactions to similar experiences offers an interesting field for speculation.

Hesnard, D. A. WAR NEUROSES IN SERBIA. [*Jl. de Med. d. Bordeaux*, July 10, 1919.]

In the Serbian army among 500 soldiers suffering from psychoneuroses over 20 per cent. of them had motor disturbances in the legs of the type of incoördination and tremor resembling the so-called astasia abasia. In some there was an actual paraplegia. Combinations of physical and psychotherapy resulted in symptomatic cure, at least, in all of the patients.

de Schweinitz, G. E. OCULAR PHENOMENA IN THE PSYCHONEUROSES OF WARFARE. [Archives of Ophthalmology, September, 1919.]

The author disregards the comparatively small group of concussed patients with organic lesions and deals with the functional group, the patients with psychoneuroses, war shock, and hysteria. Sharp distinctions are difficult, readily become artificial, so a definite classification of the ocular symptoms is not satisfactory, but for convenience he groups the conditions as: (1) Various types of amblyopia and amaurosis, including disturbances of the color vision, in other words, "incomplete and complete anesthesia of the visual sense." (2) Asthenopias and anomalies of the accommodation. (3) Anomalies of the iris movements. (4) Anomalies of the eyelid and exterior eye muscle movements. (5) Phenomena not included in the preceding groups. Under the first group he discusses cases in which the vision was lost or blurred for a few minutes, for from several hours to two weeks, and for months or even years. He says: "During the period of being semi-conscious or dazed he is partly or entirely blind; vision often returns with the restoration of consciousness, or it may persist for varying periods of time if the soldier's attention is fixed upon or directed to his eyes." He may also have tonic or clonic blepharospasm, when he cannot open his eyes. If the lids are forced open the eyes are usually rotated upward; the pupils react normally, and the eye grounds show no change.

Ross, J. PEACE AND WAR NEUROSES. [Proc. Roy. Soc. of Med., March, 1919.]

This observer says that in the treatment of the neuroses there is one point which is of capital importance, namely, how to prevent relapse. The literature of the past four years has only confirmed what was already known, that any treatment in which the physician believed would effect an apparent cure. Electricity, hypnotism, Christian science, have their apparent as well as real cures, but methods which dispel the symptoms do not accomplish all that is necessary. Faith may dispel many symptoms, but real therapy demands the disclosure of what lies behind. According to Ross there is no fundamental difference between hysteria and neurasthenia or anxiety-state, and the underlying anxiety is an essential factor. It can be exposed by ordinary conversational methods, the elaborate technique of psychoanalysis he believes only rarely being called for. This applies to civilian as well as to military patients. The writer's method is then taken up in detail. A full history is taken. The patient is listened to for as long as he wishes to speak; he is given the chance of telling everything. He is then examined clinically and is told that he suffers from some forgotten anxiety. He is asked to think over this and report later. Almost always he will answer the problem reporting something which will explain the condi-

tion. Cases are recorded to show that such psychological treatment is neither so impossible nor so tedious as some maintain, that the neuroses are not meaningless conglomerations of symptoms, but the expression of well-defined anxiety and that the prevention of relapse is bound up with the discovery of this anxiety and with its abolition, or its perception by the patient in another light.

Mingazzini, G. THE CLINICAL ASPECTS OF FUNCTIONAL HEMISPASM OF THE TONGUE. [*Riv. di patol. nerv. e mentale*, 23, 125.]

In the first of the two cases here reported occurring in a woman seventy-one years of age, the spasm was chronic in character and affected the tongue and muscles of the lips. The second was a soldier twenty-seven years old, who after an emotional shock developed a tonic permanent spasm of the stylo- and hypoglossus, soft palate, and part of the masseters. Other recorded cases of isolated or associated spasm of the tongue are briefly taken up.

Boisseau, J. A METHOD OF TESTING ORGANIC OR PSYCHOGENIC NATURE OF MUSCULO-SPINAL PARALYSIS. [*Presse méd.*, 27, 1919, 247.]

The organic or psychogenic nature [the author uses the obsolete term functional] of a musculo-spinal paralysis may be detected by the attitude assumed by the fingers in abduction. In somatic paralysis the middle finger remains motionless and the index separates from it, the first phalanx becoming flexed and the other two remaining extended at the same time. The ring finger shows more pronounced movement, which is even more exaggerated for the little finger. The thumb is abducted and opposed, and is turned to the ulnar border of the hand in spite of the patient trying to carry out the opposite movement. In psychogenic paralysis the patient, when asked to separate his fingers, either says he cannot do so and his fingers remain motionless or the separation occurs as on the sound side. When he says that he cannot carry out the movement the fingers should be separated passively and he is asked to keep them so. In mixed or somato psychogenic cases abduction of the fingers shows the nerve lesion is not repaired, or, on the other hand, if abduction takes place normally, that the lesion is cured. The following explanation is given of the attitude assumed by the fingers in organic musculo-spinal paralysis during attempts at abduction. Normally the interossei produce (1) a movement of flexion of the first phalanges and of extension of the last two, which movement does not necessitate the extensor tendons being stretched; (2) a movement of abduction which can only take place when those tendons are stiffened by contraction of the extensors. It is therefore obvious that in musculo-spinal paralysis, while the first movement is possible, the second cannot be carried out. The efforts made by the patient involve the synergic contraction of other muscular groups, the thenar and

hypothenar muscles placing the thumb and little finger in the position described. The index and ring finger respectively are passively drawn over by the displacement of the thumb and little fingers.

Austregesilo, A. SEXUALITY AS A FACTOR IN THE NEUROSES AND PSYCHOSES. [Arch. Bras. d. Med., Vol. 9, 1919, No. 2.]

It is the experience of many years of observation as a neurologist and psychiatrist that the factors of sexuality play a predominant rôle in the neurotic and psychotic. He states that in every form of dementia, toxic psychoses, psychoneuroses, as well as in all types of imbecility and idiocy anomalies in the genital sphere are to be found in almost every case, if not in all. Erotic elements are evident everywhere in the delirious. This is inevitable he declares since the history of mankind is a record of war and religious mysticism, both of which are expressions of the sexual instinct. Heretofore the problems of sexuality have been recorded chiefly by poets, novelists and artists of all ages, but scientists have been very reserved until Freud's definite stand.

Brown, Wm. HYPNOSIS, SUGGESTION AND DISSOCIATION. [British Medical Journal, June 14, 1919.]

The author says that there is an overwhelming consensus of opinion that the one satisfactory method of treating the various forms of functional nervous disorder is that of mental analysis and reëducation which can be summed up in the term "autognosis," or self knowledge. He believes that hypnosis can be used to great advantage in this plan of treatment, but not, as formerly, for the purpose of reinforcing suggestion. Its field of usefulness lies in bringing into the patient's consciousness all of the circumstances through which he passed at the time of the development of his nervous disorder. By inducing light hypnosis and causing the patient to go through all his initial experiences these are thus brought into his consciousness and many of his disabilities are at once removed, those most readily removed being mutism, paralyses, contractures, and tremors. Various disorders of the vegetative nervous system are also much benefited, even more in fact than paralyses of the voluntary muscles. The extent to which the conditions are relieved depends upon the completeness with which the patient's original experiences are revived. The method has proved most satisfactory in early cases, but is not available in chronic cases in which there is marked fixation of symptoms.

Frank, A. EMOTIONAL DISTURBANCES IN CHILDREN. [Corresp. f. Schw. Aerzte., May 10, 1919.]

This article gives some illuminating examples of the unconscious sexual motivation which lies behind incomprehensible behavior in children. One case history is as follows: W. had been a bright boy and

prize winner in the school. Without warning, he suddenly turned to a most abandoned and perverse character. He lied and stole, obtained money by most precocious artifices so that his father had to warn the tradesmen that he was quite irresponsible. The boy was flogged and talked to but to no purpose. He was subjected to all kinds of penalties, and even the aid of the police was enlisted. The author was some time in gaining the boy's confidence. He catered to his weaknesses, such as love of chocolate, and finally learned the secret which the boy let out involuntarily and then bitterly regretted. Either the mother had ignored its full bearing or had chosen to be silent about it. While the boy was still well behaved a beautiful servant girl had been hired and had struck up an innocent friendship with the boy. At first he simply preferred the girl to his mother as a companion, but the affection at last ended in the boy's seduction by the girl. The mother then promptly discharged the servant as soon as she learned of her misconduct, although perhaps not fully aware of the degree of intimacy. The boy blamed the author for extorting his secret, cursed and raged at him and would not see him again. The moment the girl was discharged the boy "went bad" and showed hatred, first to the mother and only later and to a less degree to the father. The patient was finally sent to a small private institution, where he showed a marked irritability and hatred toward his mates. After two months of careful psychoanalytic and general treatment according to the author's modified form of psychoanalysis, a mixture of Forel's and Jung's techniques the boy became tractable and behaved as if nothing had happened. He had acquired such insight into his case that he took the physician back into favor. He finally made a healthy readjustment to his home and school.

Etienne, G., and Richard, G. BLOOD PRESSURE AS INFLUENCED BY WAR EMOTIONS. [Paris médical, August 9, 1919.]

These authors report the results of several years' observation of the effects of shelling in the town of Nancy on blood pressure. All violent shocks were found to affect the blood pressure, generally bringing about a brief stage of hypertension, lasting five or ten minutes, followed usually by one of hypotension lasting from a few minutes to two or three hours. The average rise of systolic pressure was eight to twelve millimeters of mercury, and of diastolic pressure, three or four millimeters. Where the emotional shocks are repeated, *e.g.*, if the town is shelled throughout the day, each successive shock finds the blood pressure a little higher than it had been before, and subsequently the return of the pressure to normal may be slow, especially in old persons, in whom several weeks may elapse before it reaches normal. Where the shocks are repeated for weeks or months, the systolic pressure shows a constant elevation of from ten to forty millimeters, and of the diastolic,

from ten to twenty-five millimeters. In a man aged seventy-nine years the blood pressure had not yet returned to normal after spending more than seven months in a quiet locality. Repeated emotional shocks may cause disturbances of the glandular organs, the ductless glands in particular. In one young woman, menstruation ceased on the second day when a large projectile fell not far from her. Another subject's menstrual periods always began six or eight days too soon when the town was being shelled. In several instances the mammary glands ceased to secrete. Chlorosis was frequently met with. In one case suppression of menstruation was accompanied by a considerable enlargement of the thyroid gland, with increased pulse rate. Several instances of Basedow's syndrome were seen. Two patients showed glycosuria after bombardments. The glands most notably affected by emotional shocks are the adrenals. The majority of the symptoms in subjects thus shocked are to be ascribed to sympathetic stimulation through increased secretion of adrenin. Such subjects show ocular manifestations, retraction of the cutaneous muscles, diminution of saliva, and tireless activity in seeking shelter. Where the shocks are particularly violent, an inhibitory action on the adrenals, or a destructive effect on the parenchyma of these organs may be substituted for the increased production of adrenin. Relatively slight but repeated emotions, however, cause persistent adrenal excitation with hypersecretion of adrenin and a lasting abnormal exaltation of the sympathetic system. The relatively marked effect of repeated emotions on the diastolic pressure is due to the increased adrenin secretion, which augments peripheral arterial resistance. The chronic sympathetic overactivity resulting from the constant hypersecretion of adrenin accounts for all the functional changes occurring in the other endocrine organs.

Davies, H. W., and Priestley, J. G. NERVOUS SYSTEM AND SYMPTOMS OF D. A. H. IN NEURASTHENIC PATIENTS. [British Medical Journal, October 4, 1919.]

These observers investigated one hundred unselected patients admitted to hospital for neurasthenia and found definite symptoms of D. A. H. in thirteen, less marked symptoms in fifty-seven, and no appreciable evidences of D. A. H. in the remaining thirty patients. Among the one hundred patients fifty-two gave a history of gassing or of recent infection previous to the development of the neurasthenia. Among those with definite D. A. H. symptoms 92 per cent. gave a history of recent gassing or of infection; 65 per cent. of the less marked D. A. H. cases gave a similar history; while among those without such symptoms only 47 per cent. gave a history of gassing or infection. The neurasthenic symptoms were so varied that they could not be properly analyzed, but no relation could be discovered between the frequency of occurrence of exaggerated reflexes and the severity of the D. A. H. symp-

toms, or between exaggerated reflexes and a history of recent gassing. The occurrence of tremors was studied and it was found that tremors were more severe in cases showing well marked D. A. H. than among those not suffering similarly. The Hering-Breuer respiratory reflex was very commonly disturbed in these cases and in view of the prevalence of functional nervous symptoms it was sought to determine whether or not this disturbance was of a functional nature. The results of attempts to control the reflex by hypnotism failed to show definitely the functional nature of the disturbance. Under hypnotism the respiration could be slowed for a short time during the period of the patient's relaxation, but permanent effects could not be obtained.

Fraser, D. THE MIND FACTOR IN DISEASE. [Med. Jl. Australia, Oct. 11, 1919.]

In a letter to the editor of Med. Jl. Australia, the author says: "In your excellent article on the above subject you close by saying: 'Suggestion can do much, but it cannot replace these or analogous methods of treatment.' As one who devotes most of his time to the practice of psychotherapy, perhaps you will allow me to say that what the average medical man wants to be fully seized of is, what suggestion can do. There is still a great deal of prejudice and ignorance in the ranks of the profession about the whole subject of suggestive treatment. Its application, whether by hypnotic suggestion, suggestion alone, persuasion, psychoanalysis, etc., is still either damned by faint praise, or openly scoffed at by men you would expect to know better. In 1884, when passing through arts in Aberdeen, Professor Stirling, then Professor of Physiology (now of Owen's College, Manchester), lectured to us on hypnotism. He prophesied the coming of a day when we should understand it better and make greater use of it. I trace to the "suggestion" of that lecture my life-long interest in psychotherapy, whether as shown at Lourdes, holy wells, shrines, in the Emmanuel movement, the hosts of Christian scientists or its tardy and grudging use in medicine. Some sixteen years ago I entered medicine at Sydney University. In passing through its various classes, I heard a reference made to hypnotism once, to 'suggestion' never.

"As in the medical school, so, too, in the hospital, I never heard the slightest allusion made to psychotherapy by any of the teachers in clinical medicine. I may be wrong, but for the past ten years I do not remember one single evening being devoted to this subject by the B. M. A. All honor to Sir Thomas Anderson Stuart; he tried two years or so ago to introduce something in the shape of a psychotherapeutic clinic to Prince Alfred Hospital, but, so far, I do not know that much has come of it. Can one wonder, then, that men, turned out utterly ignorant of the very rudiments of psychology, with an unbounded faith in a pill or a potion, with an itching desire to use a

scalpel, should have no time for 'mental medicine' and no use for a 'psychical' scalpel that might 'pluck from the memory a rooted sorrow'? If Dr. Springthorpe in his article on 'War Neuroses and Civil Practice' (*The Medical Journal of Australia*, October 4, 1919) has stressed the value of psychotherapy, surely it is not before time. Medicine is only now beginning to take the question up. We do not know yet what suggestion can do, nor what it cannot. It has never had a fair trial. It is rash to say it has no influence over organic lesions. Professor Hewlett, of London, in his 'Pathology' has had to alter the old definition of inflammation. He says: 'In persons susceptible to hypnotic suggestion that a burn which has been caused in the skin will lead to hyperæmia, redness, exudation and swelling at the spot, *i.e.*, the changes of acute inflammation'; but let that pass. I am convinced that what we need is a greater and greater knowledge of what suggestion can do, and a place for a study of the new psychology in the medical curriculum; then psychotherapy will find its proper sphere in medicine and become the chief corner stone in the newer therapeutics, without in any way encroaching on the domain of the surgeon, the bacteriologist or any other specialist in medicine."

Hesnard, A. FUNCTIONAL ASTASIA ABASIA AS A WAR NEUROSIS.
[*Journal de médecine de Bordeaux*, July 10, 1919.]

The author comments on the frequency of this condition in the Serbian Army, no less than 115 cases having been encountered among unwounded men suffering from functional nervous diseases. In some the condition had already developed during the Balkan Wars, and it had recurred in a more severe form during the recent conflict. The causes of the condition seemed very variable—infections in some instances, exposure, exhaustion, violent or repeated emotional shock in others. The intensity of the spastic manifestations was such as to suggest organic spinal disease, with very active reflexes and relaxation sometimes quite impossible. There were often minor peripheral organic disturbances in addition, such as terminal neuritis following frost bite, rheumatic conditions, etc. In addition to the types of locomotion described in 1916 by Laignel-Lavastine and Courbon, *e.g.*, short steps, long steps, precipitate locomotion, the inhibitory gait, duck walk, bather's walk, pseudocerebellar gait, etc., there were a number of new types of locomotion, each patient, in fact, having practically a special gait of his own. Some showed what the author terms the skater's gait, the legs being rhythmically crossed; others walked as though on the deck of a ship in a storm; one had the scissors walk, one foot scraping backward as the other advanced; another the armchair walk, etc. These cases are to be ascribed neither to neurasthenia, the anxiety neurosis, nor hysteria exclusively. The writer would term them hysterioemotional astasia abasia, believing that each of the three major neuroses

mentioned may be involved in variable ratio in different cases. The patients always recovered under combined physical and psychotherapy. Physical measures comprised continuous positive galvanization, mild and prolonged massage, hot air, light, tepid baths, diathermy, etc. In psychotherapy, care was taken to adjust the reëducative measures to the physical capabilities of the more or less exhausted patients.

Laignel-Lavastine, R., and Courbon, P. THE SINISTROSIS OF WAR. [Rev. Neurol., June, 1918.]

Sinistrosis of war is here defined by these authors as a state of mind in the sick and wounded soldier attributable more to social and legal sequences than to the actual sickness and consisting of a desire conscious or partly unconscious to obtain material and moral indemnity from the government. There is a lack of desire to get well and brings to mind the saying of Brissaud: "in an uninsured workman a simple fracture of the leg heals in forty-three days, in an insured workman, on the other hand, it takes three hundred days." Sinistrosis is not the same as simulation, but differentiation is not always easy. The left-handed reasoning which stamps the condition is illustrated by the sufferer from malaria who courted a prolongation of fever, even death, by refusing to take quinine and by the man who had suffered from concussion of the brain and whose reply to the assurance that he had no organic lesion was: "If I had not been hit, Doctor X, would not have written 'pithiatism' on my papers, a new disease from which one cannot recover, because it is not to be found in the dictionary." In the production of the disorder there are various demoralizing factors, one of which is the influence of well-meaning persons who unconsciously exaggerate the rights of the wounded, while knowing that the realization of these rights is impossible. There are three stages of evolution; the first may be manifested by attempts to shirk going under fire (pyrophobia); the second by a sense of revenge: "The government has not hesitated to take my health, disorganize my family and ruin my affairs, therefore, I must 'get even'"; while the third stage is devoted to a consideration of the indemnity. The treatment of the condition depends on national organization, on the employment of competent doctors and military officers and on civilians all doing their personal duty to the nation, each in his place using his power to reduce the number of sick and wounded, hasten their recovery and calm their sense of grievance.

Drysdale, H. H., and Gardner, J. S. HYSTERICAL HEMIPLEGIA. [J. A. M. A., Oct. 25, 1919.]

A case of hysterical hemiplegia in a married man, a diver by trade, who had had good health during youth and no special history of family disease. He had been discharged from the United States Navy on account of malarial infection, May 10, 1904. After war was declared

against Germany he applied for enlistment in the army, but was rejected, for what reasons the authors are unable to ascertain; but it is presumed that the examining officers considered the fact that he had been discharged from the navy as physically disabled. He was later accepted in the Canadian service. Nothing special was noted until August 1, when he claimed to have been rendered unconscious while a member of a rescue party. From that time he had been paralyzed and had been treated in various hospitals. The neurologic symptoms were confusing. The first examination by the authors showed a contracted left hand, weakness and limp of the left leg, plus an apparently complete Babinski phenomenon of the left foot with a more or less pronounced clonus of the left ankle and patella. These clinical observations had been observed also by Canadian medical officers, and influenced their diagnosis of an organic hemiplegia. The fact that the soldier sustained a slight flesh wound of the left scalp, followed by paralysis of the same side of the body, including the face, and that subsequent roentgenograms of the skull and Wassermann tests of blood and spinal fluid were reported negative, raised doubts, and after a month's observation the authors became convinced that the disability was of hysterical origin. The improvement by suggestion and subsidence of some of the nervous symptoms strengthened their belief. A subsequent change for the better under treatment, largely moral, supported their view. The possibility of coexistence of an organic lesion was considered but rejected. The numerous examinations which he had undergone, his overhearing the physicians' remarks in regard to his case, and the fact that he received pensions sufficient to support him, all acted in keeping up his condition and preventing recovery. The authors offer this report to show also the extent to which hysteria may simulate organic diseases and to illustrate the difficulties in avoiding errors of diagnosis in such cases.

Hamburger, F. PSYCHOGENIC CREMASTER REFLEX. [Münch. med. Wchnschr., 66, 1919, 461.]

Long before puberty in adults and even in adolescents the testing of cremaster reflex shows that the testicle may be drawn up on one or other side as soon as the patient sees the doctor preparing to elicit the reflex. This psychogenic form of the cremasteric reflex is apparently more readily obtained in neuropathic than in normal subjects, which is a form of begging the question and offers no real idea of the significance of the psychogenic factors involved.

Book Reviews

Sidis, Boris. *THE SOURCE AND AIM OF HUMAN PROGRESS.* Richard G. Badger, Boston.

This short essay contains many interesting reflections, some of which the author has developed in his previous writings. He here collects and unifies his views of the subconscious and man's conflicts with the forces about him, formulates a working principle which he summarizes about as follows: "The remedy for all those human sufferings, virulent mental epidemics, and other severe social maladies that plague mankind in its aggregate capacity is to be found in this. Fortify the resistance of the individual by freedom of the individuality and by the full development of personality. Immunize the individual against social, mental plagues by the full development of his rational reflective self, controlling the suggestible automatic subconscious with its reflex consciousness. Put no barriers to man's self-expression, lay no chains on man, put no taboos on the human spirit.

"One thing stands out clear and distinct, and this is, the source and aim of true human progress are the cultivation and development of man's self-ruling, rational, free individuality. . . . This is also man's happiness."

Bojer, Johann. *THE POWER OF A LIE.* Translated from the Norwegian by Jessie Muir. With an Introduction by Hall Caine. New York, Moffat, Yard and Company, 1920.

The fiction which occupies itself with the actualities of character is always a help in understanding the more scientific explanation of these same facts. Such fiction represents situations and psychic activities with the vividness of first hand intuition. The characters are convincingly true to life and at the same time the writer's artistic sense submits them to an analysis not always easy in the quick passing of real characters over the stage of everyday activity. The psychiatrist finds therefore important analytic help in the reading of such literature.

A Norwegian writer has presented in this book a most interesting exhibition of mental mechanisms as they work to turn men and women away from the actual realistic facts of the individual mental life in order to find an easier path to some external end. Actual recognition of facts would always have required a far more definite and courageous dealing with one's own personality than the members of the race have ever shown themselves capable of. This is becoming well known

through psychotherapy, which has to deal with inability to face situations within oneself and better them from that simple but difficult starting point. It has to work its way through the maze of false interpretations, projections, shiftings, self consolations, religious and otherwise, which have been unconsciously utilized to cover and soften the truth and have resulted in actually hiding it and turning it externally to tremendously effective lies.

In this story the author has revealed the weaving of such a fabric through the use of all these psychic means. The characters are drawn with compelling truth and individuality and the subtly produced effects of deception upon individual participants and upon the whole community are strikingly developed. The story involves the weakness and guilt of two men pitted over against each other and each lacking the honesty and courage to turn back to the source of the difficulties. Since both are drawn into a legal situation concerning what comes to be the guilt of both, the book has a bearing upon the legal side also of the distortion of self deception possible and really common in the mental life. Its analysis and development are suggestive of much that would be interpretative in both medical and legal situations. In these two professions at least the tremendous power of a lie should be profoundly considered.

JELLIFFE.

Lugaro, E. LA PSICHIATRIA TEDESCA NELLA STORIA E NELL' ATTUALITÀ.
Firenze, Tipografia Galileiana.

This book forms an interesting history of psychiatry, bringing together in review the contributions of different lands and different representatives of psychiatric thought and activity to the progress of the science. A brief retrospect is made to the psychiatry of the Greeks and Romans which preceded modern thought and then the discussion is carried more fully into modern times. The author's adherence to the title of his book consists in drawing in each section of the discussion, in each presentation of a particular disease form and particular line of development a comparison between the German contributions and methods of thought and development and those of other countries.

The work was prepared during the separation and aversion of the war but for so large a work and one which in its historical material should prove a useful source of reference for general study it has perpetuated a too onesided emotional attitude toward the country then an enemy. It permits a very prejudiced point of view which distorts and neutralizes the value of the presentation of the material. It brings also into prominence the writer's resistances against certain of the newer forms of approach to the problems of psychiatry, which together with the evident discharge of affect in regard to the military enemy mar the scientific directness of the work.

Yet there should be noted the writer's generous presentation of fact, the background of psychological and philosophical interest which comes from his own wide experience and mental equipment. There are chapters each of special interest in which the work of well known individual psychiatrists is brought into clear and orderly statement, although colored by the writer's feeling. The latter in itself adds a particular interest to the work, for after all every report of scientific material must come sifted through an affective personality which therefore lends the piquancy of new psychological and philosophical material to that designedly presented. This is also to be found associated with the more general historical interest, the discussion of German methods of investigation, of conclusion and of presentation. These occupy special sections. The book is well indexed both in regard to psychiatrists and in regard to the various syndromes treated.

Rosanoff, Aaron J. Editor of *MANUAL OF PSYCHIATRY*. Fifth Edition, Revised and Enlarged. New York, John Wiley and Sons, Inc.; London, Chapman and Hall, Limited, 1920.

This fifth edition of a well-known and important work is still proof of the slowness and reluctance with which psychiatric thought fully grasps the reality and the significance of the moving dynamism of each individual and the fact that mental disease and its treatment is only a part of such a continuous energetic flux. The rewriting of this book is evidence that such a concept is growing and pushing toward acceptance and that its implications are going to make their way into psychiatric understanding and practice. The way however seems to be a long one and is still somewhat cluttered by too extensive use of descriptive terms and phrases without admission of the forces operative for both health and disease which lie behind them. There is still permitted and utilized too great reliance upon extensive, elaborated classifications, which suggest that their chief satisfactoriness must lie in the intellectual exercise they give the student's brain, a mental auto-erotism.

It is nevertheless a brightening beam of encouragement in the increasingly evident pushing forward of the editor's own attitude into something more vital, more efficacious in interpreting and thus in approaching the acutely actual human problems which alone constitute the material for the science of psychiatry and which justify its activities. Rosanoff has set himself the task of enlarging his former work to cover the rapid extension of psychiatry into more general fields than merely those within the asylum and to include a growing recognition of the interrelation of psychiatry with sociology and various classical psychological activities. He has touched upon its relation to internal medicine through the endocrinous system but only sparingly. He has rewritten and enlarged special chapters on a number of subjects, such as epilepsy, cerebro-spinal syphilis, to mention only examples. He has also laid emphasis on the change in attitude toward these problems and has

thereby been caught in the fundamental dynamism which underlies all understanding of mental diseases and must form the attitude of approach to them. He has manifested in this a unifying treatment of the broad and various subjects which come under survey and some realization of the significance of various disorders and symptoms of disorder to the personality. His introduction of the chapter on psychoanalysis, largely in the form of well-selected quotations from Freud and a few of his followers, is evidence of this appreciation of an advancing viewpoint. All this however is still to a large degree obscured as to its value and its place in a complete realization of the essentially dynamic and evolutionary character of the mental life, whether in its normal psychological manifestations or in its disturbances and deviations and in effective therapeutic work with them. The author's own attitude is evidently an evolutionary, unfolding one toward this larger, more living and comprehensive grasp of the whole subject of psychiatry and as such is welcome as a sign of the time and a stimulus in the right direction. It is still to be regretted that the force of this is still overshadowed by the growth of former static modes of conceiving and approaching the mental life. Much of this material has served its day and has become only the rich soil out of which the newer more vigorous, more constructive psychiatry is arising to flourish.

Conklin, Edwin Grant. HEREDITY AND ENVIRONMENT IN THE DEVELOPMENT OF MEN. Revised Third Edition. Princeton, Princeton University Press; London, Humphrey Milford, Oxford University Press. 1919.

This third edition of the lectures originally given at Northwestern University deserves attention not only because of the original value of these, known through previous editions, but also because of the additions and rearrangements to be found here. Material has been added chiefly upon the study of the cellular basis of heredity and this has been well illustrated by figures and descriptions of cell forms and cell processes which have to do with the important subject. The chromosome mechanism has been given especial emphasis in the discussion. The book is from its origin somewhat popular in character, which detracts nothing from its deserved appreciation. Nothing of scientific accuracy or of careful use of scientific data has been omitted. The book is written always in the spirit of true investigation, that of presenting matter still under study not dogmatic and unwarranted conclusions. The author realizes the importance of the subject of heredity as a strictly biological problem demanding an accurate and continually deepening investigation in cell life. Only through it can the race and its development be understood. The facts of heredity are the very groundwork of all the understanding of the race and its development thus far as well as the basis for conscious selective improvement of it for the future. This appreciation of the importance of the subject and of the cell study in

which it resides do not exclude however from the author's viewpoint the larger dynamic field in which it forms one factor.

He discusses the unfolding of the human being through functional experience. He views mind as well as body as having arisen from the small beginning of a simple cell and the first registered sensitive experience of such a cell. Then whatever the definite tendencies, traces of former experience or established characteristics which are handed on by inheritance, they are yet active in a larger environment where the individual is moulded and developed, where he variously reacts in relation to this environment. Heredity exists in far-reaching principles not to be altered according to an act of will. Yet "small and temporary" as are the changes produced through education and environment in each individual, the dynamic unfolding of the narrower hereditary traits goes on widely and variously through each life, and this is largely dependent upon environmental stimuli. The relation of structure to function is still almost an unknown one but each is no doubt largely dependent upon the other.

The book is a stimulating one along these broad and dynamic lines. It is also a clear, detailed discussion of the many biological facts and principles involved, with an open minded presentation of the possibilities for the present and future welfare of the race.

JELLIFFE.

Bleuler, E. *DAS AUTISTISCH-UNDISZIPLINIERT DENKEN IN DER MEDIZIN UND SEINE ÜBERWINDUNG.* Berlin, Julius Springer, 1919.

Bleuler has entered a formal protest to the extent of a well thought out book against the prevailing type of thinking or nonthinking which has too long governed the practice of medicine. His complaint is not for a moment based upon a disregard of the knowledge and investigation upon which practice is based, upon the amount of medical lore which centuries of study have accumulated. His indignation is roused rather against a blind and uninquiring use of such material, which in its turn is based upon a wrong habit of thinking. This it is to which the medical profession as well as men at large need to be awakened. It is what he calls an autistic type of thinking, unconsciously governed by what men wish, even members of the medical profession, instead of by actual facts in regard to disease, and in regard to mankind's unconscious attitude toward disease. Everywhere the sick and their physicians feel the need of immediate help but few stop to seek out what the actual psychic and somatic not to say social conditions behind such need are. Unconscious self-seeking governs thinking and leads the doctor to subscribe to the patient's wishes and prescribe accordingly. The larger truth that these if searched for in the unconscious as well as in the conscious would reveal unsocial and unserviceable ends, the very worsening of the patient, form part of the facts which medical thought has failed for the most part to penetrate.

There has been a blind and stupid following of certain long current measures without accurate constructive thought and inquiry with careful exactitude into their efficiency or their unsuitableness. Their quantitative use is a matter of carelessly inexact conventional formula, and all sorts of treatment are prolonged beyond real benefit. In all there is a forgetfulness of the fact that physicians have no mighty power to cure. Nature alone has that and the physician's function is to stand by and aid and more intelligently than has been done, to regulate the patient's life and help him in establishing and maintaining his proper attitude toward nature and all his environment with special regulation of his course in illness. It is in mental diseases and the attitude toward them that autistic thinking has been particularly in evidence. Here as in other fields necessity for understanding underlying facts instead of adopting and holding to sterile mass formulas is most pressing.

Bleuler points out the working of this autism in treatment and prophylaxis; in the formation of medical ideas concerning etiology and pathology and then suggests where the reform should be made. He pleads for a different sort of thinking for the future, a disciplined thinking which shall be content with nothing but the facts, and shall engage in a continual search for these and build up its medical conceptions and activities upon such a basis. He calls attention to the power of the quack or nonmedical healer who often comes nearer the natural truth because he is a better psychologist than the physician and utilizes imperceptibly facts of human nature and the actualities of its various relations to the environment which the physician has by his fixed thinking concealed from himself. Bleuler recognizes the difficulties which lie in the way of extrication from this prevailing form of thought but pleads that instruction and publication shall aid toward a new order of things.

Frazier, Charles H., and Allen, Alfred Reginald, collaborator. **SURGERY OF THE SPINE AND SPINAL CORD.** D. Appleton and Company, New York and London.

The development of monographic treatises in this country is a striking and a hopeful sign of medical progress. Quiz compends and textbooks have too long held sway and tended to teach so many things in so superficial and disconnected a manner that to the real inquirer they proved an illusion and a snare.

Here is furthermore not only a monograph of 1,000 pages, but an excellent one, destined to be of inestimable service for all who would combine a knowledge of surgery and neurology into a working unity. There are some seventeen chapters. Piersol opens with one on the anatomy of the spine and spinal cord. The late lamented and gifted colleague of Dr. Frazier's, Dr. A. R. Allen, gives an illuminating chapter in the physiology of the spinal cord. Dr. J. A. Kolmer has a

chapter on the cerebrospinal fluid, and Dr. H. K. Pancoast one on the Roentgen examination of the spine. Then follow chapters on Spina Bifida, Traumatic Injury to the Spinal Cord, Stabs and Gunshot Wounds, Spinal Tumors, Meningitis, Surgery of Spinal Roots, Technique of Rhizotomy, Lumbar Puncture, Intraspinal Therapy, Spinal Anesthesia, Laminectomy, Chordotomy, Decompressive Laminectomy and an excellent Index. Several plates, two ingenious charts of Dr. Allen's and a galaxy of clear and practical photographs give the book a very attractive makeup.

There is little that we can say that can add any merit to this work. It stands unique in form, matter and manner, and reflects great credit upon all who have been concerned in its making.

Goddard, Henry Herbert. PSYCHOLOGY OF THE NORMAL AND SUB-NORMAL. Dodd, Mead, and Company, New York.

Dr. Goddard, who is at present director of the Ohio Bureau of Juvenile Research, after having given us a number of studies from the Vineland Laboratory, here attempts a comparatively large work which would justify the title of a practical psychology of behavior. Starting with his investigations of feeble-mindedness, he observed what was actually happening. As the author states in his preface, in one particular the problem proved easy. "These feeble minds were so simple that it was relatively easy to follow the various processes. It was not so easy to work it altogether into a complete picture."

From this as a starting point Goddard went on to study the emotional expression in the feeble-minded. It is on a basis of these two sets of factors that he constructs his book.

He first traces the development of the structure of the nervous system, from which he forms a concept of mind as neuron patterns, which at first are of the nature of simple reflexes, which grow more and more complex, constituting instinct, perception and idea respectively. Acquired patterns are added to the inherited patterns. The feeble-minded are deficient in their acquired neuron patterns. They may be defective from lack of neuron development, or are defective by deprivation. Idiots, imbeciles and morons are the three grades, the age of twelve being the upper limit for the feeble-minded.

These theses which are gathered as summaries are all developed in detail in the main parts of the book.

The nature and importance of the affective life is especially well developed by Goddard in this volume. His chapter on Habit is equally well thought out and the chapters on the training not only of the feeble-minded but all types of individuals.

We cannot further particularize but can add it is a good book along lines showing intimate contact with human material, full of good sense and practical, first-hand experience.

MacLeod, Julius. THE QUANTITATIVE METHOD IN BIOLOGY. Longmans, Green and Co., London, New York, and Bombay.

In physics, chemistry, and mineralogy the properties of the object are measured and expressed by means of figures called constants. A constant is independent of any theory; it is the exact expression of a fact. The constants are in reality the material by means of which theories are built up, the explanation of the observed facts is found and the road opened for new discoveries."

Thus the author starts to outline what he is going to try to accomplish, namely to reduce to primordia (*i. e.*, simple or elementary properties or characters) as many of the variables of the biological sciences as possible, since the variables concerning the properties of living things are such obstacles to the use of quantitative data (*i. e.*, figures).

Vagueness and general terminology must give way to more exact definitions if collective thinking is to be made possible and by the utilization of mathematical thinking some order may be introduced into the control of phenomenal understanding.

He thus starts out with the notion of species and attempts to reduce it to chemical terms. This leads to the study of environmental reactions, to notions of plasticity, to variability and to equilibrium, in which his primordia represent states of equilibrium.

The author then classifies his primordia, reducing them to uniaxial and biaxial (chess board systems) systems, which leads him to a discussion of the possibilities of chance system in which the data of biometric and mendelian measurements are freely utilized.

All of these factors are worked out chiefly by means of botanical species, mosses and grasses, and he finally concludes this intricate but interesting study by a series of applications of the quantitative method.

It will take several generations before these principles can be applied to most of the problems of neurology, but it is a book for the curious and speculative imagination.

Ellis, Havelock Mrs. JAMES HINTON A SKETCH. Stanley Paul and Co. London.

The preface, written by Havelock Ellis tells us of the inception of this book; of his early interest in this surgeon and aurist, who became immured in the study of many social problems, and of his efforts to bring the material left by Hinton into some form. After he had abandoned the task, his wife took up the work and just before her death in 1916, completed the manuscript, which is here published.

Hinton in many aspects was a mystic, but for other aspects he was vainly trying to work out the natural order of life in a moral world. Right and pleasure were not opposed. He strove to show how they were to be reconciled. "Pleasure and pain alike are but incidents, and therefore not powers, not determiners; with no power to move, and

therefore no reason to deter, nothing less than this is what nature plainly means."

Hinton preached "flexible rights," not rigid rights. In this he was a pragmatist, and although this word does not occur in the index, nevertheless he was striving towards a recognition of the pragmatic philosophy.

The chapter on Hinton's effort to square his vision with the function of womanhood is fascinating. His understanding of the male hypocrisy concerning women was uncanny and gave rise to innumerable "transference" problems which the psychoanalytic viewpoint can quite comprehend. The "negative transferences" of the "woman scorned" led to much scandal and ugly accusations, which were widely used by his enemies, and seriously interfered with the usefulness of his valuable moral propaganda. Man, in his glutton stage, for women, he pilloried and of much of the subtle and unconscious material which the analytical psychology is putting into concrete and practical form, he had a vision.

Mrs. Ellis has done a labor of love in bringing to fixed form the life of this great sex reformer who, like most sex reformers, had to stand more or less alone and bear the hypocritical taunts of the vulgar and prurient.

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Original Articles

PSYCHIATRY BEFORE HIPPOCRATES

BY JONATHAN WRIGHT, M.D.

I. AMONG PRIMITIVE MEN

Those of us able to boast of no practical knowledge of modern psychiatry often stop long enough from pursuits more familiar to us to wonder where the normal and the abnormal actions of the human mind are to be studied with any hope of discerning a line or even a broad belt of no man's land, which separates one from the other. "Am I crazy or is my neighbor? Is that pale, underfed, dirty, tattered child a moron or the victim of an environment widespread on all sides of him?" The Binet and other tests do not seem of a kind to place alongside the reagents for sugar and albumen. The literature of psychiatry has not made these matters clear to us, but we have no ground for criticism, who, after many bitter years, are unable even under the microscope, to tell a normal from an abnormal nasal mucosa.

All knowledge, we grant, is only an *à peu près*, but really to the outsider struggling for enlightenment there does seem something especially obscure about this twilight land which stretches between the acknowledged domains of the pathological and the physiological. The fairest way to ask questions in regard to this territory is first to confess ignorance and then to indicate the direction one's gropings have taken. One can then pretend to have made one's contribution to the specialty by exhibiting the vulgar errors one has made, which the more skilled in the art can not only avoid but also thereby perceive what needs illumination. Accustomed to

gropings in history after light in medicine I have wondered if this humble spirit of helping can not be best manifested by a transcript from various notes that are scattered far and wide through portfolios which I have somewhat aimlessly filled with matter often quite remote from medical interests. I am sure others, beyond the pale as well as I, have wondered just how the matter stands in the inmost circles of those whose duty it is in the courts and elsewhere to part the goats from the sheep.

This curiosity will surely be heightened when the inquirer turns to the literature of ancient medicine or even to that of anything but the medical literature of the last century or two. We cannot fail to reflect, at least many of us must somewhat shamefacedly think of those callow days of youth when the young radical declared in all the arrogance of a newly fledged materialism that he whom he saw practicing mystic rites and professing mystic beliefs must be either a fool or a scoundrel. How fundamentally different methods of thought are in different people, how widely variant are their conclusions arising even from rationalistic processes is rarely appreciated by the young in any walk of materialistic science except perhaps in that of the trained psychologist. It is a very difficult thing indeed for the man, trained in the methods of science and habituated to weighing evidence in accord with them, to realize how another individual not so trained can have formed any thing which may rightly be called opinion and belief in any other manner, much less how he can with confidence base his conduct on them and shape his actions to future ends from them. Unless however he really has arrived at that spiritual or intellectual stage when the blush forces its almost forgotten way to his cheeks at the memory of such long past insolences and *faux pas* of his youth he will hardly be in a state of mind to study the history of the past attitude of men towards eccentricity of conduct, oftentimes arising out of what we look upon as aberrations of the mind.

Having however arrived at that chastened frame of mind, to which I have alluded, or never having been affected in his youth by this particularly mortifying form of its crassness, the first thing the reader of the accounts of primitive man will notice is the scarcity of any signs of the problem of insanity and allied states with which civilized men are often confronted. He will also take note of the deference primitive man pays to eccentricity of conduct and being devoid of that radical intolerance alluded to he will not at once jump to the conclusion that the medicine man of wild tribes is a

fool or knave or more probably both. It is not necessary here to do more than preface my reference to the insane among primitive men and men of the earliest civilizations with the remark that the idea the former has of disease in general is that it is caused by supernatural beings, usually anthropomorphic, and that madness especially is the visitation of some devil or an affliction, more often the inspiration direct from some divine power which thus marks out its favorites. Notwithstanding the preponderating testimony from observations at first hand by experienced travellers and trained ethnologists to the contrary it is a frequently held belief that when among the individuals of a savage race one is to be found with the stigma of insanity he is more apt to be priest or medicine man than not. So far as we give a thought to the matter at all we thus account for the insane of primitive men. There is to be sure a basis of fact for this more or less common belief. Frazer¹ remarks that the medicine man owes to his strength or weakness of mind his place in the social organization. Unsurpassed as is his acquaintance with ethnological literature, it is difficult to find very many facts which support the impression that the medicine man deserves any imputation on the strength of his understanding. Among Guiana Indians "it has been said that epileptic subjects are by preference chosen as *peaimen*, and are trained to throw themselves at will into convulsions; and it is at least certain that the *peaiman*, when in the midst of his frantic performance, seems as though overcome by some fearful fit, or in the extreme of raving madness."² In West Africa both Dr. Nassau³ and Miss Kingsley⁴ agree that the medicine man or woman has often certain well marked neurotic traits, which the former, a very judicious observer indeed, seems to think are as much acquired as innate, the African being especially susceptible to nervous crises which "are naturally provoked by the double psychological experience which is fostered by them . . . and which are more or less dormant in every individual." The fits and trances and outrageous behavior which they assume for the benefit of the patient and his friends become an auto-infection. In Borneo, "it not infrequently happens that when a woman (or more rarely a man) is insane or is very ill, she is urged to admit that a devil has possessed her and to become a medicine woman. By this

¹ Frazer, J. G. *The Golden Bough; The Magic Art.* 2 vols. Macmillan.

² Im Thurn, Sir Everard F. *Among the Indians of Guiana.* London, K. Pane French & Co., 1883.

³ Nassau, R. H. *Fetichism in West Africa.* New York, Scribners, 1904.

⁴ Kingsley, Mary H. *Travels in West Africa, 1897; West African Studies, 1901.* Macmillan.

means she becomes well of her complaint and at the same time acquires the power of helping others to cast out devils.”⁵ This testimony is supported to some extent by that from observation of primitive life elsewhere, but in general this is not the case.

I do not know whether we are to ascribe to that crassness of juvenile judgment, upon which I have remarked, or whether we are to ascribe to professional pique and rivalry the remark of the Rev. Dr. Weeks⁶ in regard to the Africans he was trying to convert. “I am disposed to think,” he says, “that the witch doctors are largely responsible for the creation of these various spirits to account for their numerous failures in warding off sickness and death.” Now I presume that we are none of us superior to the influence of our environment. We are frequently led to share our patient’s enthusiasm for the medication we administer, but we are not fools nor altogether knaves in that act. Whether unconsciously or not we do the wise thing. The physician of primitive man has vastly more at stake. He plays his game for life or death, for riches or ruin. In primitive life the doctor belongs to the caste of kings and priests. Sometimes he bears the dignity of all three offices. Occasionally, as among the Haidas⁷ of our northwestern coasts he is as other men, but mostly he is a man apart who is hated for his acts of greed and tyranny or feared for his power or envied for his riches. He has too many enemies to be a fool and while his wits may not always be those of a knave he usually soon finds himself in a position in life where he needs them all if not in the service of his fellow men, at least in his own. We need not look among this class of men for the insane, though probably it does contain a larger number than the average of the neurotic and emotional.

If we have every reason to doubt the accuracy of the statements which make the medicine man appear as though he were suffering from aberration of the mind there can be no question that he usually desires for his own purposes to mystify and to inspire fear in his fellows so as to be placed in that class. The fear of the insane is akin to the fear of the dead and it prevails even in civilized life in exact proportion to the scale of intelligence in each social group. The primitive medicine man cannot very well mimic the dead in the face of the living but he can borrow some of that in-

⁵ Hose, Charles. *The Pagan Tribes of Borneo*, London. Macmillan, 1912. 2 vols.

⁶ Weeks, John H. *Among Congo Cannibals*. London, Seeley Service & Co., 1913.

⁷ Smithsonian Institute Report, 1888, Chapter XI, p. 348.

instinctive fear, so nearly related to it, associated with him whom "God has touched," in the opinion of his fellow men. Hamlet sought safety for his designs in madness because in Shakespeare's time the insane prince could lose his wits and live unfear'd, but the medicine man among primitive men acts like a crazy man in order to excite awe and fear. We perceive the altered states of the insane in the conceptions of sixteenth century England and that of the environment of the primitive medicine man. Where Hamlet played for safety the medicine man plays for high stakes, like the kings and emperors,, some of whom, anointed by God, have survived to our day. Like them, despite the protection of his assumed sacred madness, he not infrequently paid the penalty of the loser. The revenge of victims, whether in the bolshevist class or not, the ambition of rivals more astute or more fortunate often dug his grave for him. Mystery and unfamiliarity make up part of the sanctity which both hedge the majesty of kings and they have all had to make use of them. When knowledge finally breaks down that hedge, whether of king or priest, little resistance is possible. Place the medicine man among those to whom the gods grant infallibility. Once or twice he fails, his prestige is impaired, and his fate is that of the Russian Czar in our day. The broken winged bird, the toothless beast of prey, the unsound mind of man, still less than the unsound of body, have no place in this company which in primitive life is so jealously trimmed down by inexorable evolutionary law.

With the question of the dangers of medical practice among primitive men I have been occupied elsewhere⁸ and I need not further dilate upon it here as I have reached a point where we can thereby get an inkling into the apparent rarity of insanity among them. We already see that it has an underlying cause which is fundamental. When the bird breaks its wing, when the wolf of Kipling's tale loses the lightning speed of its spring, death is close at hand. When the wild man drops behind on the day's march from weakness or disaster, he too has little to hope from the charity of his fellowmen. Life is beaten out of the aged, often times as a matter of kindness by their children at their request. What chance has the congenital idiot or the mentally weak in such a stage of society? Man was raised from the beasts by his wits, and if he has them not he is destroyed by the beasts or by his fellows. The loose wits were more carefully combed out of the race of men at its origin than they have ever been since. With each succeeding

⁸ New York Medical Journal, February 24, 1917.

millennium man has allowed himself to breed more fools and he has been goaded in the name of his common humanity to preserve them in larger and larger numbers. As civilization increases in complexity more are unfit to meet its demands and thus also their numbers increase. The mental powers sufficient to outwit the beasts are unfit to meet the competition between man and man. Altruism preserves them, while increasing social demands render their delinquency more conspicuous. I do not see why this is not an etiological factor which it is impossible to escape as it seems a part of cosmic law. It is a commonplace to assert that modern conditions create neuroses. This may possibly also be true, quite aside from the selective functions of modern progress. It so happens that it is especially the soma of the nervous system which has furnished both experimental evidence and deductive argument from observation for those who argue the reality of the transmission or acquired characters. The experiments of Brown-Séquard are still occasionally quoted and repeated with variations. We thus touch at a tangent the confines of another field in which complexity of cause and effect has long raged and this I wish to avoid.

The ancient theory of the etiology of neuroses was vastly more simple. Anthropologists have found ample support in history for their observations on modern primitive life which reveals an almost universal belief in the intrusion of evil spirits into, or the influence of supernatural powers on the insane. It is doubtless due to the universality of this belief and to its antiquity, coeval with the birth of mentality in man, that we are to ascribe the instinctive fear still exhibited by him for the insane. It is a companion emotion to the fear he has of the dead. In the infancy of man the spirits of the departed hovered around their dead bodies and the spirits of evil inhabited the bodies of the living who were insane. Both, primitive man believed, had evil designs upon him. The terror of ghosts is still with us.

We thus see that various aspects of modern thought in neighboring fields enter even into such a slight consideration of the attitude of primitive men as I have here indulged in. It is not well to apply too often or too closely canons of biological science to sociological questions, but it is quite apparent, I think, that if society is to benefit by the application of results gained in the study of psychiatry, the question of the transmission of impressions made on the nervous system to subsequent generations must be cleared up. It seems assured that certain nerve defects are hereditary and prob-

able that, in inheritance, some of them follow Mendelian formulas. To mention only these considerations, they are interesting enough though by no means novel in the discussions as to the etiology of neuroses, but we are accustomed to them for the most part in arguments which do not touch the confines of the history of medical thought. The chief thing to keep in mind, when we enter the historical era of the evolution of thought, is the state of things we have left behind us in the prehistoric times of primitive men and of the earliest civilizations, of which archeology has lately taught us so much. When we take up the written records in which we get more or less direct examples of ancient man's mental activities, in contradistinction to those which we seek to ferret out by the circumstantial evidence which archeology affords or which modern primitive life offers in the records of ethnology, notwithstanding the fragmentary and incoherent nature of them, it is nevertheless these latter we must keep in mind. If we are to understand what the most ancient screeds or wall inscriptions have of interest for us we must hark back to the thought of primitive man known to us in other ways.

It is a mere glimmer we get, at best, of the actualities of life in the ancient civilizations before the rise of Greek culture. If they are to appear in any way real to us we must seek to make them connecting links between the somewhat uncertain environment of ancient primitive man and the actualities as they appear in the most ancient of written records. We have scarcely any way of thus entering into the inmost thoughts of ancient Egyptians and Mesopotamians unless we accept the testimony of facts elicited by observations on modern primitive man as a guide to those existing at the dawn of human culture on the Nile and the Euphrates. From archeology alone we have received sufficient proof that this surely was merged gradually around the Mediterranean into the pre-Hippocratic culture of Greece. So surely do we now feel ourselves in possession of this historical link in the continuity of the world's thought that we are justified in indulging *à priori* hypotheses in searching for the connecting link between the Sacred Disease of the Hippocratic Corpus and the demon etiology of primitive men. Some trace of this we are able to find in the Bible, but to this I will not resort. Holy Writ is so transfused with the soul of Greek conceptions, even in the Old Testament, that it is difficult and for other reasons it is embarrassing, to use it as a guide to the scientific study of the history of thought. What we find engraved on the

stele of Hammurabi and what speaks to us from similar inscriptions in Egypt and is found in the Amarna letters, are not open to these objections. The Amarna letters were found in a jar full of papyri rolls and represent a correspondence which dates back nearly 3500 years to the reign of the heretic king Amenhotep III (1427 B.C.). The letters seem to have passed between this monarch and some rather arrogant Asiatic ally. They are frequently amusing and usually acrimonious. Breasted⁹ believes that the forefathers of this importunate king of the Mitanni, one of whom was Dushratta, had sent Ishtar of Nineveh, the goddess of healing and of many other things, to minister to the ills of Egyptian kings, one at least of whom had been suffering from the ailments of old age. From other records we learn that Ramses (II), the Great, a mightier man than Amenhotep and reigning 100 years later, sent doctors to the king of the Kheta, who may have been the fair-haired invaders of the Mediterranean basin before the Trojan war. One of the daughters of this monarch was one of the wives of Ramses, the heroine (?) of one of Ebers's novels (Uarda). The king of the Kheta had another daughter. It was to cure her that Egyptian medical consultants journeyed into Asia Minor probably, and if so she was a Hittite. These seem to be facts which history and archeology think rest on reliable data. It is interesting to see the doctors, mere oriental slaves, sent back and forth between courts. It was hardly befitting to speak publicly of them by name. They were only lowly servants of the respective gods of Babylon and Egypt, who took the responsibility of the doctoring. Their names were of no consequence. They cowered full of guile behind the shield of divinity. Tradition at least made the gods Ishtar and Khonsu out of them. The authors of the therapy in the Papyrus Ebers take pains to say it came with them out of the temples of the immortal gods at Heliopolis and Sais, out from beneath the feet of the god Anubis at Letopolis. The medical priests in the times of the predecessors of Amenhotep were taking no chances. In the time of the Ptolemies, long after Herodotus visited Egypt, even the high priests were hard put to it to uphold the dignity of their heavenly masters. Breasted supposes that they resurrected that successful visit of the god Khonsu to the red-headed king's court in the time of Ramses, more than a thousand years before perhaps. These priests of Ptolemy set up a stele and

⁹ Breasted, James Henry. *Ancient Records of Egypt*, 5 vols. Chicago University Press, 1906, 7.

See also Hall, H. R. *The Ancient History of the Near East*.

on it was inscribed the account of the case of the Princess Bentrish of Bekhten. They got the names all mixed, the wise men now tell us, but some of these latter venture to say that the princess was possessed of the devil, had hysteria and was open to suggestion, I suppose. She listened not to the first Nile doctor who came and they had to send the genuine god Khonsu himself and he cured her, whatever she had. The Ptolemaic faculty made out her illness as serious as possible, no doubt. It is useless to inquire whether she had the "sacred disease," epilepsy, or the devil's own disease, female hysteria, but evidently it is the earliest intimation we have, in these Amarna papyri and on the monuments of Ramses, of the transfer of primitive magic from one civilization, from one continent to another. We see the mystic ritual of the driving out of disease, independent of the later records of Holy Writ, and we cannot help agreeing from the whole nature of the tale that modern critics are very probably correct in the diagnosis of that early case as a female trouble of the nerves. It is desirable to introduce this record here as it suffers only from that obscurity which is a characteristic of all primitive medicine, a lack of differentiation.

We get very little insight into the occurrence of insanity and other forms of nervous disease from the Babylonian records. Sudhoff¹⁰ thinks the *bennu* disease, against which in one of the old Babylonian bills of sale there is a guarantee in the transfer of a slave, was epilepsy. On the Merodachbaldan stone (721-710 B.C.) Harper¹¹ finds something he feels free to translate "paralysis of the muscles," but neither they nor the Greeks at that time had any knowledge even of the muscles, which has left any record to attract our attention, much less of the nerves any conception of what we mean by paralysis.

(To be continued)

¹⁰ Sudhoff, Karl: Die Krankheiten Benu und Sibtu der babylonischen-assyrischen Rechtsurkunden. Arch. f. Geschichte der Medizin, Bd. 4, 1911, hft. 5, s. 315.

¹¹ Harper, Robert Francis. Assyrian and Babylonian Literature, 1904.

PUPILLARY AND REFLEX DISTURBANCES IN TWO HUNDRED AND SEVENTY-FIVE CASES OF NEUROSYPHILIS

BY LAWSON G. LOWREY, A.M., M.D.

CHIEF MEDICAL OFFICER PSYCHOPATHIC DEPARTMENT, BOSTON STATE HOSPITAL,
INSTRUCTOR IN NEUROPATHOLOGY AND PSYCHIATRY, HARVARD MEDICAL SCHOOL

AND

MARY K. BENEDICT, M.D.

INTERNE, PSYCHOPATHIC DEPARTMENT, BOSTON STATE HOSPITAL, SUMMER, 1918

It has seemed to us as we viewed the run of cases in our clinic that pupillary and reflex disorders were not absolutely trustworthy guides to the presence or absence of neurosyphilis, in view of the number of cases showing such clinical abnormality yet with negative serological findings, and the number of cases without such findings but serologically positive. Accordingly, we have examined the records of *all* cases of neurosyphilis seen during a year and a half to determine what the clinical findings were, utilizing only cases in which the presence of neurosyphilis has been proven, but not further selecting the cases in any way.

The most elaborate study of this kind of which we have record is that of Bumke ("Die Pupillenstörungen bei Geistes—und Nerven—Krankheiten," Jena, 1911) which includes the earlier literature. His tables show that 62 per cent. to 71 per cent. of cases of tabes show pupillary reaction disturbance (including both the Argyll-Robertson and completely spastic types). In the early stages pupillary disturbance is found in from 23 per cent. to 45 per cent. of cases, according to various observers.

In general paresis, the Argyll-Robertson pupil was reported in 41 per cent. to 62 per cent. of cases: the reaction was "sluggish" in 11 per cent. to 30 per cent.; and there was a good reaction in 2 per cent. to 30 per cent. of cases. Anisocoria was reported in 4 per cent. to 90 per cent. of cases, most observers reporting 40 per cent. or more.

In cerebrospinal syphilis disturbance of the pupillary reaction and anisocoria occurred in about 44 per cent. of the cases.

TABLE I.
PUPILLARY REACTIONS AND OTHER ANOMALIES IN 275 CASES

	Argyll-Robertson Type		Stiff to Light and Distance		Sluggish to Light and Distance		Impaired—Not Further Specified		All Types of Impaired Reaction		Reaction Unimpaired		Unequal		Irregular		Both Unequal and Irregular	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
General paresis, 186.....	78	41.9	19	10.2	15	8.0	20	10.7	132	70.9	54	29.0	59	31.7	96	51.6	38	20.4
Tubo-paresis, 12.....	8	66.6	3	25	1	8.3	0	0	12	100	0	0	2	16.6	6	20.0	1	8.3
Tubes, 8.....	5	62.5	3	37.5	0	0	0	0	8	100	0	0	4	50.0	6	75.0	2	25
Juvenile paresis, 4.....	1	25.0	2	50	0	0	1	25.0	4	100	0	0	1	25.0	2	50.0	0	0
Neurosyphilis, 65.....	20	30.7	5	7.7	7	10.7	8	12.3	40	61.5	25	38.4	14	21.5	25	38.4	10	15.2
Total, 275.....	112	40.7	32	11.7	23	8.3	29	10.5	196	71.3	79	28.7	80	29.0	135	49.0	51	18.5

Our material comprises two hundred and seventy-five cases, with clinical diagnoses as follows: General Paresis, 186 cases; taboparesis, twelve cases; tabes, eight cases; juvenile paresis, four cases; neurosyphilis (not further specified) sixty-five cases. The diagnoses are those of the staff of the department, and have not in any case been altered. In tabulating the observations we have thought it wise to keep these various groups separate, and to specify the types of disorder found, so that we may have a concrete idea of the prevalence of each common type of change in each group.

The most important single sign in nervous disease is believed to be the Argyll-Robertson pupil. Some regard it as pathognomonic of neurosyphilis, although our own experience does not bear this out. In tabes and taboparesis it is supposed by some to occur in every case. In our series, only ninety-two of two hundred and ten cases (43.5 per cent.) of paresis, taboparesis, juvenile paresis, and tabes showed the phenomenon. Of the whole series, 40.7 per cent. reacted in this way. That is, there are some cases (twenty) in which the diagnosis is not more exact than "neurosyphilis" showing the phenomenon.

We find that 71.3 per cent. of all our cases show impaired pupillary reaction—40.7 per cent. Argyll-Robertson; 11.7 per cent. spastic both to light and on accommodation; 8.3 per cent. "sluggish" to light and on accommodation; 10.5 per cent. with "impaired" reaction not further specified—leaving 28.7 per cent. of cases in which the reactions were normal. So we can safely say that about seven in ten cases of neurosyphilis will show *some* abnormality of pupillary reaction, though only five in ten will show a stiff pupil, and only four in ten the Argyll-Robertson reaction.

Inequality and irregularity of pupils are very common, especially the former. Such changes are of limited value in diagnosis, particularly when, as is often the case, the changes are slight. It is, however, distinctly surprising to find only 29 per cent. of the cases showing anisocoria. That irregular pupils are of importance is shown by the 49 per cent. of occurrence. Furthermore, irregular pupils are of more diagnostic import than unequal pupils, since the number of possible causes is less, and the necessary lesion rather more severe. The combination of unequal and irregular pupils occurs in a surprisingly small number of cases, especially in view of the general impression one has that this combination is of frequent occurrence in neurosyphilis.

Cases can easily be found demonstrating that these types of

TABLE II.
TENDON REFLEX DISORDERS IN NEUROSYPHILIS

	Knee Jerks						All Deep Reflexes						Ankle Jerks Diminished or Absent.		All Forms of Impaired Reaction		Reactions Not Impaired					
	Hyperactive			Diminished			Hyperactive			Diminished									Absent			
	No.	%		No.	%		No.	%		No.	%		No.	%		No.	%	No.	%			
General paresis, 186.....	33	17.7		13	6.9		32	17.1	38	20.4		3	1.6	5	2.6	30	16.1	131	70	55	29.5	
Tubo paresis, 12.....		0		0			10	83.3	0	0		1	8.3	1	8.3	7	5.8	12	100	0	0	
Tabes, 8.....	1	12.5					5	62.5	1	12.5	0	0	0	0	1	12.5	0	0	100	0	0	
Juvenile paresis, 4.....		0		1	25		0		0	0	0	0	0	0	1	25	3	75	3	75	1	25
Neurosypilis, 65.....	8	12.3		6	9.3		12	18.4	7	10.7	0	0	0	0	2	2.1	12	18.4	38	58.1	27	41.5
Total, 275.....	42	15.2		20	7.2		50	21.4	46	16.6	4	1.4	10	3.6	50	18.1	92	69.8	83		30.1	

abnormal reaction, and abnormality of size and shape, occur in diseases other than neurosyphilis. One need only list the well attested occurrence of the Argyll-Robertson reaction (temporary) in alcoholics; the completely spastic pupil in arteriosclerosis cerebri; unequal and irregular pupils in iritis, etc.; to realize that when they occur they do not inevitably and irrevocably mean neurosyphilis. This, in connection with our demonstration of the number of cases of neurosyphilis without pupillary signs, is sufficient to show that too great reliance must not be placed on the pupils in neurosyphilis, especially in view of the 29 per cent. of normal pupils in cases of paresis.

II

If now we turn to the analysis of tendon reflex disorder we find that 70 per cent. of our cases show some type of abnormal response. All cases of tabes and tabo-paresis and 70 per cent. of the paresis cases show some reflex disorder or other.

The most important tendon reflex is the knee jerk, which showed an alteration in 43.8 per cent. of all cases, and in 41.7 per cent. of paresis cases. It is striking that for the whole series there was a higher percentage of lost than of exaggerated knee jerks. In view of the usual belief in the prevalence of exaggerated tendon reflexes in paresis, our figures for exaggeration of the knee jerk alone (17.7 per cent.) or for all deep reflexes (20.4 per cent.) seem surprisingly low. However, we must remember that the majority of these cases were seen relatively early in the course of the disease, and that it may well be that later in the course the typical exaggeration will occur. Our figures indicate very definitely, however, that in about one half of the cases with abnormal tendon reflexes we find diminution or absence rather than exaggeration, even in paresis cases.

Viewed in this light, that about 70 per cent. of cases of neurosyphilis show abnormal pupillary reactions, and a somewhat smaller group irregular or unequal and irregular pupils; that about 70 per cent. show reflex disorder, it is clear that we cannot absolutely rely on these, our most definite clinical signs, to determine the presence or absence of neurosyphilis. Neither their unmistakable presence nor their absence is sufficient to determine the diagnosis, though the former is of vastly greater importance.

CONCLUSION

In 70 per cent. of 275 cases of neurosyphilis we find some type of abnormal pupillary reaction: in 50 per cent. a stiff pupil and in 40 per cent. the Argyll-Robertson pupil.

The Argyll-Robertson pupil occurs more frequently in tabes and in taboparesis than in paresis.

In 70 per cent. of all cases we find some abnormality of the tendon jerks, rather more than half of these showing diminished or absent jerks.

These are our most accurate clinical signs of neurosyphilis. They are often equivocal. Hence the importance of lumbar puncture in the diagnosis of nervous and mental diseases.

TRAUMA AND OTHER NON-LUETIC INFLUENCES IN PARESIS

MICHAEL OSNATO, M.D.

ASSOCIATE IN NEUROLOGY, COLUMBIA UNIVERSITY, FORMERLY NEUROPSYCHIATRIST
A. E. F. IN ITALY

INTRODUCTION

There is probably very little doubt in the minds of those who may have considered this question as to the exact rôle which traumatic and other influences play in paresis entirely aside from the actual causative syphilitic etiology. This opinion may be a definite one in the minds of a few or may exist as a nebulous more or less hazy impression rather than a concept. Before the finding of the spirochete in the brains of paretics by Moore and Noguchi, trauma was given as one of the actual causes of paresis. The older textbooks and many of the older writers were prone to assign to the rôle that trauma played in the production of paresis a fairly prominent place. In view of the recent laboratory and pathological investigations which have cleared up the etiology and specific nature of the processes in this condition, it appears important to define the part played by influences other than syphilis in the causation or precipitation of neurosyphilis particularly of the paretic type. It is only necessary to mention the problem to appreciate the enormous medicolegal importance of this question. One need only consult recent text books and the literature on paresis to find that since the specificity of the pathology and the actual etiology have been defined, very little attention has been paid to other possibly contributing factors. Some of the recent textbooks of which the one by Dr. White (1) may be taken as a type, mention in the etiology nothing except an antecedent syphilitic factor. Others, such as the textbook by Dr. Dercum (2), state that trauma cannot be other than a doubtful contributing cause in the production of paresis. Of the older textbooks Bianchi's (3) will serve as an example. This author states that in a series of eighty-seven cases trauma operated alone in one case to produce paresis. Tanzi (4) states that emotional influences, excesses, intoxications or infections are beyond question capable of acting as contributory causes of pro-

gressive paralysis but doubts, however, the view of some observers that these may act alone as an etiological factor. Starr (5) states that in a certain number of cases paresis may be traceable to injuries and sunstroke. This author seems to follow Kraft Ebing (6) in his belief that "trauma and mental and emotional excitement and sunstroke lead to functional hyperemia of the forebrain and more readily during biologic phases, when the brain is naturally in a state of physiologic turgescence or disposed to congestion (as in the climacteric)." Kraft Ebing further states that a "continuance of the irritation or the continued activity of influences which paralyze vasoconstrictors (alcohol, heat stroke, injury, etc.) passes over into neuromyolytic hyperemia. . . . The same is true of other infectious diseases and chronic intoxications, . . . but the disease process in general paralysis as such early leads to changes in the vessel walls which favor the increase of permeability of the vessels,—resulting in transudation of the elements of the blood into the perivascular and interadventitial spaces in the form of colloid and albuminous materials, white and a few red corpuscles. As a result there is a decided lymph stasis. . . ." Concerning cerebral syphilis Kraft Ebing (page 594) believes that following such influences as overwork, excesses and injury the localization of the affection in the brain may take place after many years, particularly as a result of "trauma capitis." In one of our cases this seems to be corroborated by the history which will be detailed later.

In going through the literature it has been practically impossible to find material upon which to base an opinion as to the influence of trauma and other non luetic factors in the precipitation of paretic neurosyphilis since the definite pathological and laboratory proving of the diagnosis of paresis has been made possible. The views of the old authors upon this point, because of the fact that the exact etiology of paresis was unknown to them, must necessarily have little weight. It seemed therefore important to me to assign to trauma a definite place as to its influence in paresis. This at first would appear to be a rather simple matter, yet the files of the Vanderbilt Clinic for the past three or four years since very careful histories have been kept, were disappointing in several respects. The writer started out with the decision to use no case which was not proved by laboratory examinations or autopsy to have been an actual case of paresis. Another difficulty was the fact that an injury or an infection other than syphilis, and its possible influence in the precipitation of a paretic reaction in neurosyphilis apparently did not interest many examiners, for careful inquiry was not made

concerning these points in many cases. As a result taking only absolutely proved cases of paresis, the files of the Vanderbilt Clinic for the last three and one half years yielded only seven cases for this study, the other six being cases from my private files. In the accompanying chart there is detailed a summary of all the cases which form the basis for this study. Apparently the same difficulty has been encountered by other writers, for Southard and Solomon (7) in considering the medicolegal and social problems of paresis quote only several cases in their book. These authors believe with Mott whom they quote, that the symptoms of a post traumatic paresis must not develop until after at least a weeks' interval of freedom from symptoms because at least that much time is required to destroy or irritate the brain to the point of producing the paretic picture. Mott states that a gumma sometimes occurs at the site of the trauma. Southard says that the interval following injury should not be longer than three months in order to enable one to determine definitely the influence of trauma as a causative factor in the production of a post traumatic paresis. This author also agrees with the Canadian medical army officers that the great strain under which men at the front have lived and the physical injury due to being buried, etc., is probably responsible for an increasing number of cases of neurosyphilis.

THE NATURE OF THE PATHOLOGICAL PROCESSES IN TRAUMA AND PARESIS

Having made it obvious that a sufficient number of the older and more recent authors yield to trauma a possible influence in the production of paresis, it would seem that the best method of approach in considering the problem would be from the pathological viewpoint. Tanzi and Lugaro (8) believe that the difference between the syphilitic cerebral processes and those of paresis are explained by the difference in the site of the infecting organisms. In the former the spirochetes are found in the blood vessel walls, in the lymphatics and in the membranes, in paresis however, they are very abundantly found in the ectodermal elements and to a much less degree in the mesodermal. They believe that an endogenous or exogenous element intervenes in the cases of cerebral syphilis to produce an alteration in the permeability of the blood vessels allowing a continuous passage of spirochetes and their toxins into the ectodermal tissues thus transforming syphilitics into paretics. They state that if the viewpoint of various French authors that a specific nervous strain of spirochetes is responsible for paresis is true, then

the validity of the views concerning the action of other predisposing or concomitant factors must be questioned. This they do not believe possible. They feel with Kraepelin that alcohol and other toxic and infectious agents do have a contributing predisposing influence in the production of paresis. They feel that the influence of psychic stress however has been greatly exaggerated. Concerning the influence of trauma, their opinion is that it is difficult to determine with precision the real part which it plays. "Certain it is that trauma may determine certain syndromes which deserve the name of pseudo-paresis traumatica. It is possible that trauma favors a decadence of the nervous system in syphilitics. . . . The relation of trauma and paresis awaits an accurate revision in the light of recent anatomical and sero-diagnostic investigations." These authors found (page 325) in the pathological investigations of the brain in the traumatic psychoses, various sized recent and old hemorrhagic foci, transformed into cysts or glial scars, also diffuse lesions in the neuroglia and nerve cells and chronic changes of a diffuse nature in the small blood vessels. One must admit therefore that at the time of the trauma localized gross lesions occur to which may be added later mild and diffuse changes of a chronic nature consisting of gliosis and degeneration of nervous elements. To this picture of the traumatic psychoses one must add the splendid investigations of Adolph Meyer (9). Nothing in any literature which I have been able to find compares with this particular work in throwing light upon the nature of the processes in the brain, both clinical and pathological, which occur as a result of trauma. Meyer says that injuries to the cranial contents occur at the point of maximum impulse and at a point opposite, chiefly at the tips of the temporal lobe, the base of the frontal lobes and in the central gray surrounding the third and fourth ventricles. Lacerations occur in the brain at the points at which tissues of different specific weight meet, such as, in the ventricular linings and in the pia, owing to the difference in specific weight between the cerebrospinal fluid and this tissue, especially also at the point of juncture of gray and white matter. According to this author, hemorrhages as a result of trauma to the head are not as a rule very copious unless an already affected blood vessel yields, which may occur even several days after an injury. The lesion in many cases at autopsy is a hemorrhagic infiltration of contused brain tissue. This author agrees with Cannon that the edema of the injured tissues is the cause of the rise of intracranial pressure. It does not matter whether the cranium is fractured or not and in

fact Meyer states that even a relatively extensive destruction of the skull may be more favorable than otherwise. These observations are important in view of the fact that very few of our cases had at the time of examination any gross evidence of injury to the skull or any certain residual symptoms of injury to the brain. Concerning this point, the observations of Frazier (10) are important. This author found that following trauma, injuries to the brain tissue "not destructive in character complicate all sorts of lesions and cause symptoms which last for weeks or months, but which tend towards complete recovery." He believes that the early loss of consciousness and the loss of memory, indifference and mental slowness have a pathologic basis in the effects of the trauma, namely, the hemorrhage, edema and increased pressure due to concussion. He refers to the fact that although a great number of his two hundred cases of wounds of the head had focal symptoms, these disappeared almost completely within one or two months following the injury. He explains this by postulating injuries to the brain of a degree "insufficient to cause tissue destruction." Twenty-four of his two hundred cases had an early hemiplegia which later disappeared entirely or left an "insignificant remnant." Other cases with aphasia, cerebellar and sensory signs also improved to a remarkable degree. Of the entire two hundred cases sixty suffered permanent motor symptoms of cerebral origin, in forty-seven however, the "residual motor disability was comparatively slight." The author further refers to cases which were admitted to the hospital as litter patients, many of whom later recovered with a slight irreducible minimum of paralysis or of impairment of cutaneous sensory perceptions. An important observation by the same author is the following, namely, that an area of destruction of brain tissue in cerebral lesions in the absence of penetrating foreign bodies conforms "quite closely to the cranial defect and extends but a few centimeters beneath the cortex." The fact that paresis is more particularly a disease of the superficial layers of the cortex will readily recall an analogy with these characteristics of cerebral injuries. These observations also explain very readily the reason that so many of our cases failed to show at the time of examination, many months, sometimes, after the injury, any definite residual neurologic signs of cerebral injury. Concerning these points, Meyer states (page 382) that lesions of the brain leave as the most frequent residuals small foci of softening or defects of the cortex. In autopsied cases this author found the preservation of the subpial glia in many foci rather than an absence of glia margin with

residuals of blood. Further he found consecutive Wallerian degenerations in the frontal lobes, the corpus callosum, external and internal capsule, caudate nucleus, in various parts of the olfactory apparatus, the optic chiasm, the crura, lateral fillet, optic nerve, superior cerebellar peduncles, the fifth nerve and various diffuse changes in the brain and spinal cord in the nature of a gliosis. Concerning the development of paresis upon this traumatic groundwork, the author states that a traumatism "is apt to add to the chances of precipitating the cerebral reaction, but on the other hand the traumatism will hardly be able to bring about the paralytic brain changes without previous brain syphilis." He then gives the autopsy findings in two cases of general paresis which were supposed to have been of purely traumatic origin. In discussing these two cases the author refers to the signs of direct damage to the brain such as hemorrhages, edema, etc., which together cause either a necrosis or a temporary malnutrition. The death of nerve cells seems to be irreparable therefore these areas are replaced by the coarse scars and secondary degenerations mentioned above.

When this article of Meyer's was written the specific pathology and serology of paresis was not definitely known, for this reason the author decided to leave the question of the influence of trauma in the development of paresis an open one, although he definitely stated that the literature contained undoubted cases of paresis precipitated by injury.

It is quite evident from these discussions that carefully studied autopsy material is needed in which the undoubted evidences of trauma can be found associated with paresis before the pathological side of this question can be completely closed. In discussing the nature of the mental symptoms following trauma Kraepelin (11) believes that the mental and emotional states are caused not so much by the large injuries resulting in cerebral defects but by the subtle changes which occur often quite gradually and in some cases even a long time after the injury. With views such as have been quoted above and with the pathology of trauma of the brain in mind, it does not require much argument to prove that the specific pathological processes of paresis may be initiated in a given cerebral syphilitic by an injury to the head. This injury may therefore not only act by producing an increased permeability of already defective blood vessels or by causing actual hemorrhage or destruction of brain tissue but even simple concussion may be followed by diffuse changes in the glia and the nerve cells which in their last analysis are similar to the chronic diffuse ectodermal changes oc-

TRAUMA AND OTHER NON-LUETIC INFLUENCES IN PARESIS

Date of Infection	Date of 1st Symptom	Date of Injury and Character	Laboratory Proof	Mental and Other Signs
1. 1898 no secondaries. Soldier at Camp Meade. Clinic case No. 23954.	Headaches and dizziness and paresthesia left upper and lower extremity in 1918 after fall from horse.	Feb., 1918, was thrown from a horse, stunned. Got up and mounted horse. Not unconscious, no operation.	B. W., 4 plus. Sp. Fl., " to 0.1. C. G., 5555543 to. Glob., 4 plus.	From 1898 fainting spells and convulsive seizures for a few years. Of late has recurred. Bad memory. Romberg ataxia, speech elision and perseveration. No delusions or hallucinations.
2. 1910. Clinic case No. 23568.	Thickness of speech June, 1918.	Fell 1902, struck left temple, lost sight in left eye.	B. W., 4 plus. Sp. Fl., " to 0.2. Cells, 12. 2 plus. C. G., 5554310000.	Unsteadiness, loss of memory, somnolence, Romberg, slurring speech, doubtful left Babinski, hypertonicty of legs. Old left choroido-retinitis, A. R. pupils. No mental signs except memory and emotionalism.
3. 1910. Clinic case No. 26678.	Stumbling, loss of memory, amnesic periods. In 1915 after the injury.	Nature of injury not determined except that there was a head injury in 1915.	Spinal fluid and blood W/4 plus.	Is at Central Islip. Blindness left eye sudden in 1917, left optic atrophy, facial tremor, slurring and elision in speech. Memory defect, emotional. Ideas of infidelity (wife), expansive delusions. Much mental deterioration. Wife a G. P. at Kings Park.
4. No history of syphilis. Clinic case No. 25866.	Difficulty of writing and of speech and sight. Pain in head after fall. Onset 6 months ago, had to stop work.	6 months ago fell down stairs, was weak. Struck left side of head. Weakness came on suddenly. No operation.	B. W., 4 plus. Sp. Fl., " to 0.2. Cells, 120. Glob., 4 plus.	No delusions or hallucinations. Some ataxia in lower extremities, slurring, tremor of hands only, defective memory. Symptoms all since the fall.

Date of Infection	Date of 1st Symptom	Date of Injury and Character	Laboratory Proof	Mental and Other Signs
5. Chancre 25 years ago, Clinic case No. 24977.	18 months ago became "dopey" after he was struck on back of head.	18 months. Unconscious 7 hours after he was struck on the head. No notes as to nature of injury.	B. W., 4 plus. Sp. Fl., 4 plus. Not proved otherwise but patient clinically G. P.	Ataxic gait, small irregular pupils, tremor of hands and tongue, great loss in weight. Perseveration of speech and slurring. Memory poor.
6. Denies infection. Clinic case No. 24890.	Discharged from army after 9 months service, drafted. Had fears and was irritable. Speech slurred and indistinct. Very seclusive and apprehensive. Discharged from army late in 1917.	Trauma entirely psychological, mental reaction almost like a negativistic depression or katononia.	B. W., 4 plus. Sp. Fl., " Glob., " C. G., 5555555210.	Almost negativistic. Attacks of amnesia last 15 minutes, great apprehension, loss of interest. Answers in monosyllables.
7. Accidental chancre of finger (while operating) 16 years ago. P. B. Private at Italian Hosp. (physician) private.	In 1914 began to have tabetic paresis frank undoubted tabes till May, 1918, took 4 grains of morphin. After some weeks gradually changed from a profound suicidal depression to an elated expansive manic state. No hallucinations.	Had large septic bed sores. Infected bladder, in May, 1918. In Aug. 1919 fell in trying to walk. Parietic mental signs followed quickly. Broke right ankle (fibula) ankle joint greatly bruised and swollen.	B. W., 4 plus. Sp. Fl., " to 0.2. Glob., " Cells, 140. C. G., "no parietic curve" 1916.	Parietic mental signs, great boastfulness, sends much rambling visionary literature to medical journals, expansive, silly, too liberal expenditures. Poetry and writing plays. Tremor face, tongue and hands, poor retention and recall. Memory bad for dates, A. R. pupils, tabetic signs, slurring speech.

Date of Infection	Date of 1st Symptom	Date of Injury and Character	Laboratory Proof	Mental and Other Signs
8. Married 6 years. Husband died of heart disease, had syphilis. Clinic case No. 20408.	3 years immediately after operation for tumor. Pan hysterectomy, pain in chest, abdomen, and right upper extremity. Memory loss.	Prolonged etherization (ether solvent of brain lipoids) caused rapid onset of neuro-syphilis. Operation 3 years ago by Dr. Sarnarelli at Italian Hosp.	B. W., 4 plus. Sp. Fl., " " Cells, 20. Glob., 4 plus. C. G., 5555543200.	Tabetic reflexes, A. R. pupils, memory loss, pains in chest and stomach, tremor of face and hands, grave speech defect. Tabo-paresis.
9. 19 years ago. Private folder No. 788.	Influenza one year ago. Tired, pain in right arm and both legs.	Severe attack of influenza with pneumonia.	B. W., 4 plus. Sp. Fl., 1 " " Cells, 12. Glob., 0. C. G., negative.	Depressed, cries, sleeps badly. Tremor hands and tongue, ataxia lower extremity, moderate memory defect because of agitation, not a real defect. C. S. Lucs.
10. 16 years ago. Private folder 1020.	Since April 17, 1919. Pain in frontal region, pain in both legs, memory loss.	April 3, 1919, fell 18 feet striking his head. Unconscious. Remained in hospital 2 weeks, returned to work in 5 weeks then had to stop.	B. W., 4 plus. Sp. Fl., " " No other reports.	Never lost a day from work until injury. Nothing mentally except grave memory defect. Romberg, tremor, left clonus, A. R. pupils.
11. Denied. Private folder 781. C. S. Lucs undoubtedly antecedent.	June 5, 1919, paralysis (left hemiplegia).	On June 5, 1919, a falling plank struck right parietal region and upper back. To Bellevue Hospital 3 days. Gross evidence of fracture of skull at R. vault. Unconscious after injury in definite period.	B. W., 4 plus. Sp. Fl., " " Glob., increased. C. G., "no parietic curve." Cells, 50.	Unsteady gait, signs of left hemiplegia. Incontinence of urine and feces at times. A. R. pupils, ataxia, Romberg, memory defect, thick speech with elision and syllable stuttering, tremor face and hands July 9, 1919.

Date of Infection	Date of 1st Symptom	Date of Injury and Character	Laboratory Proof	Mental and Other Signs
12. Denied. Wife has been "de- mented like he for past 4 years." Private fol- der 915.	June 1919 after injury (3 weeks) began to mum- ble things, had delusions and hallucinations.	May 22, 1919, fell 3 stories. Linear fracture vault of skull. Frac- tured 6 ribs left chest, numerous contusions and abrasions.	B. W., 4 plus. Sp. Fl., 4 plus. X-ray shows linear frac- ture of vault.	Left optic atrophy, delusions of grandeur, euphoria, restless activity, hallucinations (all visual), great intellectual and emotional deteri- oration.
13. Denied. Later says "he had chancres 4 5 8 years ago." Mercury treat- ment and 606 twice. Private folder 353.	Sept. 13, 1917 had not lost a day's work before accident. Has not worked since. Extreme dizziness and unsteadiness, great loss of memory and in- tellect failing rapidly.	A piece of joist fell down an elevator shaft striking back of his head and neck. Unconscious for several minutes. Tak- en home semi-conscious in an auto.	B. W., 4 plus. Sp. Fl., 4 plus.	Vertigo, unsteadiness in station and gait, left optic neuritis, patellar clonus. Tremors and speech defect, great boastfulness and memory loss.

curing in paresis. In this way the paretic reaction may be instituted, its occurrence precipitated and the entire process hastened by cerebral injury.

The fact that the path of infection of the brain by the spirochete is by way of the walls of cerebral blood vessels seems to have been recently proved by Orton (12). This author found two types of lesions in the blood vessels. One was stationary and the other showed a chronic progressive inflammation. The stationary lesions were those of healed syphilitic endarteritis with thickening of connective tissue between the intact endothelium and the elastica. This author believes that these lesions are due to varying degrees of syphilitic arteritis during the early stages of the infection and are not characteristic of the paretic process in the vessels. This latter process consists in an active inflammatory change characterized by a lymphocytic and plasma cell exudate in the adventitia. These processes were found not only in the cerebral blood vessels but also in many extra-cerebral vessels, usually in those of the internal carotid system. These findings are sufficient according to this author to prove "the hypothesis of the invasion of the brain by way of the peri-arterial lymph spaces." The paretic process therefore would be a persistent vascular infection with an even balance between the invasive "power of the parasite and the resistance of the host lasting a number of years, . . . with ultimate invasive spread in multiple small foci to the brain parenchyma" (page 77). This being the case, any injury to the small blood vessels which will allow the spirochete to enter the brain tissue will immediately favor the institution of the paretic process. This injury may be an actual trauma with hemorrhage or it may be an infective or toxic process which injures the intact endothelium and favors the entrance of the spirochete into the adventitia and the peri-vascular lymph spaces. The toxic agent may be alcohol as such or in the form, as would seem to be the case in one of our patients, of ether or chloroform or it may be the toxins of influenza, as seems to have happened in another of our cases.

A CONSIDERATION OF THE CASE HISTORIES

Unfortunately in the clinic cases particularly, exact data concerning the accident and the period of latency following the accident before the supposedly paretic symptoms made themselves manifest, have not been obtainable.

1. In case 1 the patient had suffered from fainting spells and convulsive seizures for a number of years following the initial lesion

which occurred in 1898. These convulsive attacks had ceased for several years prior to the injury of February, 1918. On that day this man was thrown from his horse, striking his head; he was not unconscious but merely stunned. He got up in a few seconds, remounted his horse and continued on his way. There was no scalp wound. No operation on the skull was performed. The patient immediately began to complain of headaches and dizziness and paresthesia of the left upper and lower extremity with weakness. The convulsive seizures recurred. At the time of the examination no physical evidence of the injury was present. The patient and his relatives insist that he was perfectly well before the accident and able to do his work. Since the accident he has grown progressively worse, the convulsive seizures have returned and he shows the gross memory defects and physical signs of paresis. There are none of the signs of pyramidal tract or other purely focal cortical involvement. There are no delusions or hallucinations.

2. This patient seems to illustrate the contention of Kraft-Ebing that a previous injury, even though occurring a long time before the onset of the paresis, may determine the localization of the process. This patient fell in 1902, striking the left fronto-temporal region. He became unconscious and upon regaining consciousness had lost sight in the left eye. The onset of his parietic symptoms began in June, 1918, with thickness of speech. The eye examination at the present time shows an old left choroido retinitis with optic atrophy. Despite the fact that Kraft-Ebing, as quoted above, insists that a continuance of irritation such as might occur from an injury of the brain resulting in a state of local congestion is sufficient to cause a decided lymph stasis and thus predispose to parietic infection, this case at least is of doubtful value in lending weight to this view. This patient had a left Babinski, Romberg, ataxia, speech defect, but no mental signs except loss of memory and some emotionalism. Note should be made of the fact that he showed a fully developed paresis eight years after his syphilitic infection. While this is not an unusually acute latent period, the injury might be said by some to have been a contributing factor in evoking the early parietic reaction.

3. The nature of the injury was not determined in this case excepting that it was an injury to the head which resulted in a loss of consciousness. Shortly after this, the exact period of latency not being disclosed in the history, the patient began to complain of unsteadiness in gait, loss of memory and definite periods of amnesia.

The patient is now at the Central Islip State Hospital. He has a left optic atrophy, tremor, speech defect but no other physical signs. Mentally this patient shows the so-called parietic picture. He is expansive and gives expression to ideas of wealth and power but shows also a strong paranoid trend, accusing his wife of infidelity. The wife, also suffering from paresis, is a patient at the Kings Park State Hospital.

4. This patient six months before examination became suddenly weak and fell down stairs striking the left side of the head. There was no scalp wound, no depression of the skull and no operation, but several days thereafter he began to complain of difficulty in writing and in talking, dimness of vision, headaches, and finally had to stop work. There are no mental signs except the memory defect. Ataxia is quite marked. No pyramidal tract signs. When seen at the clinic this patient was a very advanced case of paresis, although the onset was given as only six months before. It seems quite likely that this patient had a sudden attack at the time of his fall, of parietic weakness. He undoubtedly was suffering at that time from paresis, but there is also very little doubt that the progress of his symptoms after his accident was unusually rapid.

5. This patient was struck on the back of the head eighteen months before the date of examination, by a heavy object and was unconscious for several hours. The exact nature of the injury is not disclosed, but his relatives state that he became dull and restless immediately afterwards and was unable to do any work, whereas before he had worked steadily and efficiently. The patient is now in the Manhattan State Hospital with a diagnosis of paresis. There are no mental signs except perseveration of thought and speech and memory defect. The physical signs of paresis are present.

6. This case was purposely included in order to bring up the matter of emotional shock as a predisposing or exciting cause for the precipitation of parietic reactions in neurosyphilitics. There have been a number of cases analogous to this reported during and since the war, particularly by English and Canadian officers. This patient had been entirely efficient and dependable in his work until he saw service in the army. He was drafted early in 1917, was in the service nine months and finally had to be discharged because of his mental condition. The mental reaction was exactly like that of the war neuroses. He was very fearful and apprehensive and irritable, would not go out by himself, slept badly and was anxious and depressed. He was taken to the base hospital in camp. Here he was diagnosed as a psychoneurotic and was discharged

from the army late in 1917. After his discharge he did not do well and finally came to the Vanderbilt Clinic complaining of gross memory defects, attacks of amnesia lasting about fifteen minutes, dullness and retardation amounting almost to negativism, loss of interest, etc. Mentally the picture was that of a psychoneurosis of the phobic type, but upon investigation of the blood and spinal fluid the diagnosis of paresis was made. The entire problem of the evaluation of the emotional factors in the production of paresis is brought up by this case. The matter must be entirely speculatively handled, it seems to me, for many reasons. The chief among these is the lack of information as to the exact physiological changes which take place as a result of fear and other emotions. It is true that evidence seems to point towards the possibility that certain internal secretions are thrown in excess into the blood stream as a result of the emotion of fear. Just how this is done and the exact nature of the physiological effects of such secretions are not definitely known. If we accept the theory that anything which might increase the permeability of the cerebral blood vessels might also allow the spirochetes and their toxins to get into the brain tissue, then it is possible to assume that the increased tension caused by an excess of the adrenal content in the blood and a hypersecretion of the thyroid gland might so alter the blood vessels of the brain as to produce an increased permeability or an actual damage to their structure. Of course attention should also be called to the changes caused in nerve cells by fatigue and the emotions as pointed out by Crile (13). If such changes as he describes in the liver, adrenal and brain can occur as a result of emotion and fatigue alone, there seems no doubt that severe and prolonged emotions in syphilitics might so lower the vitality of nerve cells and so change the tension of blood vessels and the blood supply of the brain that the invasion by spirochetes of the brain parenchyma might be facilitated. This whole subject is of course quite speculative and uncertain, nevertheless all of us have had the experience during the war of seeing cases apparently actually precipitated as a result of the stress of war.

7. This patient was a physician who received an innocent chancre of the right index finger while operating sixteen years ago. In 1914 he began to have tabetic pains and by May, 1918, he had developed a frank tabes. There are a number of interesting factors in this case aside from the actual injury. When I saw him he was thoroughly depressed, was refusing food, cried, bemoaned his fate and showed considerable psychomotor retardation. He would not

assist himself, resisted care and attention and prayed for death. He had a number of nasty bed sores and a catheter cystitis which gave him occasionally, particularly at night, several degrees of temperature. In May, 1918, he attempted suicide several times and one night took four grains of morphin. He became unconscious but after suitable treatment he recovered consciousness several days later and after a few weeks of intensive psycho-therapy his mental attitude began to change somewhat, he became more hopeful, responded to treatment and after a time was able to get up and walk about. It seemed almost a miracle to see how quickly his physical condition improved with the change in the mental state. His bed sores healed up and the cystitis became less annoying under treatment and he improved in every way. Under reëducation by Dr. Morris Grossman, he began to walk about. In August, 1919, he fell while trying to walk alone without his stick. He sustained a fracture of both bones about the right ankle and several bruises of the head and face. Within a few weeks he began to show a remarkable mental change. He became very boastful, spent money freely, laughed a great deal, told many jokes and began writing several articles and books. He deluged the editors of the *Journal of the American Medical Association* with most amusing, bizarre and fanciful articles of a medical and semi-medical nature, wrote poetry, plays, novels, and had a great time generally. He has continued in this manic state to date, although recently he has quieted down somewhat and has even begun to see an occasional patient. This change in his mental state occurred quite soon after his injury. Before that he had nothing but the ordinary physical signs of tabes including Argyll-Robertson pupils. Following the accident he exhibited the exalted excited psychomotor restlessness of the manic, just as he had been previously in a typically depressed state. Aside from the actual influence of his manic depressive personality which undoubtedly colored the paretic mental picture (14) there are other points of interest. The very doubtful traumatic factor may be considered as a possible precipitating cause of the paresis in this case but there was also the more important factor of the infection of the bladder and bed sores. The toxins from these infections circulating in the blood probably altered in some way the structure and therefore the permeability of the endothelial lining of the blood vessels, allowing spirochetes and their toxins to enter the adventitial lymph spaces and the brain cells, which were also in all probability affected primarily by the toxins resulting from the infections.

8. This case is of interest mainly because the entire paretic

picture began quite definitely after a prolonged etherization. The patient was operated upon and a pan hysterectomy was done about three years ago. Immediately following the operation she began to complain of pains in the chest, legs and abdomen and in the right upper extremity. She began also to show grave memory defects. She had the physical signs of tabes but mentally was a paretic. She is now being treated at the Vanderbilt Clinic and shows progressive mental deterioration but no delusions or hallucinations. One must recall in this connection the fact that ether and chloroform are lipo solvents. Pighini (15) says that narcotics provoke a chemical modification of the brain which is translatable into an increase of the water content and a diminution of cholesterin. In prolonged anesthesia it is not improbable that there is a quantitative change in the phosphides caused by a liberation of the lipoids from their lipo protein mixture, the cholesterin splitting off and becoming dissolved in an aqueous state while the phosphatids emulsify in situ and tend to absorb some of the circulating phosphides. The patient under discussion was under anesthesia for several hours. Granting that a tabo-paresis was already present in this patient, the chemical action of the ether for such a long time upon the brain substance undoubtedly predisposed it to further destructive changes. One must remember too, that this author has investigated the biochemical changes occurring in the brains of paretics and has found a diminution in all the lipoids but especially those of the non-saturated phosphides. Cholesterin however is maintained in normal percentages but there is an increase in the water content and a total increase in the proteids so that at least part of the biochemical changes caused by ether and chloroform are similar to the changes caused by paresis itself. It is only a logical step forward to assume a reciprocal destructive influence produced by the narcotic and the ectodermal syphilitic infection in this case resulting in the rapid development of paresis.

9. This patient had a severe attack of influenza with pneumonia during the influenza epidemic of 1918. Immediately after recovery from this attack she began to complain of pains of a sharp lancinating character in the right arm and both legs. Following this she became depressed, cried a great deal, slept badly and had a tremor of the face, hands and tongue. She was ataxic and showed a moderate memory defect which depended at least in part on the difficulty in obtaining and holding her attention. As can be seen from the table the blood Wassermann and spinal fluid findings in this case were those of a cerebrospinal syphilis rather than paresis.

Before the attack of influenza she had been perfectly well. There seems little doubt therefore that the toxins of this infection brought about sufficient changes not only in the arteries of the cerebral system but also in the nerve cells themselves, to allow the invasion by spirochetes to occur. The exact nature of the pathological change in the blood vessels leading to this is only speculatively known. It seems fair however to assume that such acute changes as occur with any other acute infection in the intima and other layers of the blood vessels took place here; allowing the spirochete and its toxins a freer field for their specific action. The acute cloudy swelling and other primary degenerative changes in brain cells occurring in acute infections would also predispose to further toxic degenerative changes of a secondary nature caused by the spirochetes and their toxins.

10. This patient on April 3, 1919, fell eighteen feet, striking his head. He was unconscious for a number of hours and remained in the hospital for two weeks in a semi-conscious state. He returned to work in five weeks but complained so of pain in the frontal region and showed such gross memory defects that he has never been able to work since. Before the injury he had never lost a day from his work. He had shown no mental signs, had no hallucinations or delusions but showed all the physical signs of paresis including Argyll-Robertson pupils.

11. On June 15, 1919, a falling plank struck the right parietal skull and glanced off striking the dorsal region of the spine. He was taken to Bellevue Hospital, where he remained three days. There is gross evidence of a depressed fracture of the right vault of the skull in the fronto-parietal region almost directly over the Rolandic area. He left Bellevue Hospital with a left hemiplegia. A few days after he came home, there was unsteadiness of gait, ataxia, Romberg, typical paretic speech, stuttering, memory defect, tremor, etc. In this patient the initial hemiplegia was undoubtedly due to the trauma.

He had worked steadily up to the date of his injury and had shown no apparent signs of paresis.

12. This patient fell three stories on May 22, 1919. He suffered several linear fractures of the skull, fractured six ribs on the left side of his chest and had many contusions and abrasions. Prior to the injury he had worked steadily and showed no symptoms of mental trouble. Three weeks after the injury he began to mumble incoherently, expressed delusions of grandeur, was expansive, excited, slept badly and had visual hallucinations. The

patient was quite alcoholic. When I examined him four months after the injury he was a very advanced case of general paresis with intellectual and emotional deterioration. The patient's wife has suffered from a similar trouble which has lasted four or five years, according to the son-in-law. There were no focal signs at the time of my examination referable to the cranio-cerebral injury.

13. A heavy piece of joist fell down an elevator shaft striking this patient on the back of his head and neck. He was unconscious for quite a long time, the exact period being indefinitely known. Several days later he began to complain of great vertigo and staggering gait, and upon examination several months later was found to have a marked defect of memory with much intellectual dulling. There was patellar clonus, tremor, expansiveness and speech defect. This patient had perfectly normal pupils. It is definitely established that he had not lost a day's work for many years before the accident and that nothing unusual was noticed about his physical or mental condition. In view of the entire absence of any of the pupillary signs of neurosyphilis and of this history it would seem undoubted that this case of paresis had been precipitated by his injury.

GENERAL COMMENT ON THE CLINICAL MATERIAL

Regarding the dictum of Mott mentioned above, that the paretic symptoms must have commenced after a period not longer than one week following the accident before they can be attributed to the accident and regarding Southard's extension of this rule to three months, one must in the light of these cases say that such definite limitations are entirely arbitrary and reflect simply the individual views of these writers on this point. In all of our cases the history has been quite definite that the symptoms began immediately after the injury, that is, a few days in most cases and not more than a few weeks later in any of them. It seems to me that it is ill advised at this time to state any definite time limit beyond which the responsibility for the production of paretic symptoms cannot be laid to the trauma. This is especially in view of the fact that the acute focal symptoms of the brain trauma may be transient and often negligible so far as immediate results are concerned. The observations of Meyer and Kraepelin mentioned above, show that the total final pathological process and the correlated clinical symptoms may not occur for many months after the injury. The diffuse gliosis and the sclerotic changes in the nerve cells following cranio-cerebral injuries are not acute processes and do not take place until the contused brain substance has had a chance to react to the mesodermal

and ectodermal injury. The ectodermal pathological reactions to injury are the latent and more chronic changes which give rise to the memory defects and the chronic mood changes and intellectual and character changes of so-called traumatic insanity. Therefore given a patient in whom the possibilities of the production of a true traumatic brain change of this nature are present, the maximum mental symptoms depending on the trauma may not occur for a long time after the injury. The parietic symptoms, although their development might be quite gradual, would not in such a case show their most marked manifestations until they were superimposed upon the even more gradually developing signs of a traumatic psychosis. It seems best to leave the question of the latent period following injuries an open one, waiting for pathological material to decide this point.

It will be recalled that according to Meyer the portions of the brain showing the greatest change in the traumatic psychosis are the tips of the temporal and frontal and the occipital lobes, the gray matter around the third and fourth ventricle. In fractures of the skull where the force has been applied to the vault, that portion of the base of the skull close to the point of application of the force is most apt to suffer. Fractures of the anterior fossa of the base would be apt to lead to involvement of the orbital plate injuring the frontal lobes and the olfactory regions of the temporal lobes. Fractures through the optic foramen would be apt to cause optic atrophy. Injury to the occipital lobes would also tend to produce optic atrophy with hemianopsia. Where the gray matter and white matter in the region of the third ventricle is involved the pulvinar of the thalamus might be injured also giving optic atrophy. Injury to the thalamus would also produce disturbances of affect and tend to cause emotionalism. A glance at a section of the gray matter round the third and fourth ventricles will show that the nuclei or the fibers of almost any of the cranial nerves might be involved. The nuclei more readily accessible to injury in this region would be the third, fourth, sixth, seventh, ninth and tenth nerves. Other masses of white fibers or gray substance which might be injured at the level of the third ventricle would be the corpora quadrigemina and the superior and middle cerebellar peduncles and further laterad the internal capsule and its structures. If these anatomical sites of preference for the localization of injury are correct, then there ought to be an anatomico-clinical correlation of the neurologic symptoms. In cases 3, 12 and 13 there were following the injury evidences of optic nerve injury. In case 3 the optic atrophy was not

discovered until two years after the injury. Of course it might be argued that the atrophy was a primary one depending on the neuro-syphilis rather than the injury, however such an atrophy is usually bilateral and furthermore it is perfectly possible to have almost complete blindness in one eye without it being discovered for a long time. In cases 12 and 13 the optic atrophy seems to be directly due to the cranio-cerebral injuries which were quite severe. It is interesting to note also that in case 12 the hallucinations were entirely visual. This might be correlated with injury to the visual psychic areas or the cuneus of the occipital lobe. In cases 2 and 4 the first symptoms were dimness of vision and disturbances of speech. The dysarthria present might very well have been due to injury to the ninth, tenth or twelfth cranial nerves. In cases 6, 7, 8 and 9 an actual cranio-cerebral injury is not a factor so that they will be left out of this attempt at anatomico clinical correlation. An actual hemiplegia or hemiparesis was the first symptom in cases 1 and 11. Here an injury either to the cortex or the internal capsule seems most likely. In case 1 the return of convulsive seizures which had not occurred for many years prior to the injury might have been due to injury to the tip of the temporal lobe in the region of the cornu ammonis. In cases 3, 5, 10 and 13 the great memory defect and rapid intellectual dulling may very properly be correlated with an injury to the frontal lobes. The emotionalism in some of the cases might be laid to changes in the thalamus without too great a stretch of the imagination. The amnesic periods which began so shortly after the injury in cases 3 and 5 can be correlated with injury to the frontal lobes.

The course of the disease in the cases following injury showed hardly anything that might be said to be different from the usual cases of paresis not influenced by trauma, excepting that the general course tended towards a more rapid development of total physical incapacity. It is interesting to point out that in only three of the cases were there any hallucinations or delusions. In at least one of these three the parietic reaction was colored by a manic depressive personality and in another the visual hallucinations may also have been determined by alcoholism. The point which was stressed sometime ago (14) seems borne out in these cases. From this viewpoint most cases of paresis fall into two groups. In one the ordinary physical signs and the memory and intellectual defects are all that are present and depend entirely on the destructive and irritative pathological lesions. In another group the mental symptoms with hallucinations, delusions and mood reactions occur,

These cases are probably determined by defects in the personality of the individual and by emotional factors.

The treatment which was quickly instituted and regularly continued in both the clinic and private cases gave no better results than in paresis not complicated by trauma. In the one case of cerebrospinal syphilis (case 11) following influenza, considerable improvement was obtained.

CONCLUSIONS

1. There are undoubted acute and chronic pathological lesions of the brain ascribable to trauma of the head with or without injury to the vault or base of the skull. The early results of injury are due to hemorrhage and laceration or destruction and edema of brain tissue, the later results are due to gliosis and sclerosis of nerve cells. These latter pathological changes produce the so-called traumatic insanity. The earlier symptoms produce focal paralytic lesions or simple concussion.

2. The symptoms and pathology of traumatic insanity are similar in some degree to those of paresis. This statement refers more particularly to the memory and intellectual defects and the pathological reaction of the ectodermal elements of the brain.

3. It appears from the evidence submitted above that cerebral syphilis of the parietic type develops when something happens to change the permeability of the blood vessels of the brain, thus allowing the spirochetes and their toxins access to brain tissue. Trauma of the brain may therefore, by causing vascular injury or brain destruction, be followed later by gliosis and nerve-cell sclerosis allowing first the spirochetal invasion, and later adding to the gliosis and sclerosis of nerve cells which are also an integral part of the parietic brain pathology.

4. It would appear from the clinical cases submitted, that certain cases of paresis have been acutely precipitated and others adversely influenced by cranio-cerebral injury.

5. Other toxic substances such as the toxins of influenza, infections, alcohol and ether may have an influence similar to trauma in the production or precipitation of parietic neurosyphilis in an individual already suffering from cerebral or general syphilis.

6. The question of the effect of emotional stress and bodily and mental fatigue on the production or precipitation of paresis must be left for further investigation.

7. The responsibility of any given injury to the head occurring

in a non-paretic syphilitic must be absolute if the paretic signs follow the injury and disable the patient soon thereafter.

8. In order to lay the responsibility for such an occurrence upon any given injury it is impossible to use the period of latency as an absolute criterion of responsibility because even in ordinary traumatic insanity this period during which the pathological processes are occurring which are responsible for the later chronic mental symptoms, may be indefinitely prolonged.

9. It would appear to be indicated that any syphilitic suffering from a trauma to the head with possible cerebral injury should immediately be given prolonged rest and active intensive anti-syphilitic treatment with a view to killing as promptly as possible any spirochetes which may have gained access to the brain substance. In order to favor the production of this result the anti-syphilitic treatment should be begun immediately after consciousness is recovered and the acute symptoms of shock due to the injury have disappeared.

10. One must be prepared for a possible paretic reaction following infections and prolonged etherization in a known syphilitic.

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DYSTONIA MUSCULORUM DEFORMANS WITH A REPORT OF A CASE¹

BY HENRY W. FRAUENTHAL, M.D., F.A.C.S.

PHYSICIAN AND SURGEON-IN-CHIEF TO THE HOSPITAL FOR DEFORMITIES
AND JOINT DISEASES

AND

CHAS. ROSENHECK, M.D.

NEUROLOGIST TO THE HOSPITAL FOR DEFORMITIES AND JOINT DISEASES

This bizarre form of muscle unrest has been the subject of considerable attention since Ziehen² demonstrated a case in a child before the Berlin Psychiatric Society in 1910. His belief that it was a neurosis and that it had its origin in those ill-defined, functional disturbances known as impulsive tics, was somewhat disproved by Oppenheim³ in the following year, who wrote an extended article on the subject. Oppenheim considered the peculiar motor activity as a fundamental, organic affection having its analogue in the athetosis. Subsequently Flatau and Sterling⁴ described several cases and in the main confirmed the description of the disease as originally described by Ziehen and Oppenheim. In this country Frankel,⁵ J. Ramsay Hunt,⁶ Spiller,⁷ Climenko,⁸ Abrahamson⁹ and others observed and reported cases which closely conformed to the description of the cases as given by the original observers. J. Ramsay Hunt, in par-

¹ From the Hospital for Deformities and Joint Diseases.

² Ziehen, Tonic Torsions Neurose, *Neurol. Centralbl.*, 1911, xxx, 109; *Allg. Ztschr. f. Psychiat.*, 1911, lxviii, 281.

³ Oppenheim, Ueber eine eigenartige Krampf Krankheit des Kindlichen und jugendlichen Alters; *Dysbasia Lordotica Progressiva*, *Dystonia Musculorum Deformans*, *Neurol. Centralbl.*, 1911, xxx, 1090.

⁴ Flatau and Sterling, *Progressiver Torsions Spasmus bei Kindern*, *Ztschr., f. d. ges. Neurol. u. Psychiat.*, 1911, vii, 586.

⁵ Fraenkel, *Dystonia Musculorum Deformans-Tortipelvis*, *JOUR. NERV. AND MENT. DIS.*, 1912, xxxix, 361.

⁶ Hunt, J. Ramsay, *The Journal of the American Medical Association*, Nov. 11, 1916, Vol. LXVII, pp. 1430-1436.

⁷ Spiller, *Case of Dystonia Musculorum Deformans*, *JOUR. NERV. AND MENT. DIS.*, 1913, xl, 529.

⁸ Climenko, *Case of Dystonia Musculorum Progressiva*, *JOUR. NERV. AND MENT. DIS.*, 1915, xlii, 167; *Med. Rec. New York*, 1914, lxxxvi, 1000.

⁹ Abrahamson, *Case of Dystonia Musculorum Deformans*, *JOUR. NERV. AND MENT. DIS.*, 1913, xi, 38.

ticular, has studied the subject closely and has given an excellent summary of the affection.¹⁰



FIG. 1. Case of Dystonia musculorum deformans, showing entire somatic musculature convulsed in torsion, flexion and extension spasms.

The case herein reported merits an extended description on account of the duration (10 years) and that at this stage it represents

¹⁰ Journal of the A. M. A., Nov. 11, 1916, Vol. LXVII, pp. 1430-1436.

the extreme type of the disease with all its attendant dystonic phenomena.

The Case.—The patient is a female, age seventeen, born in this country of Jewish, Russian parentage. There is no history of any serious illness prior to the age of seven. About this period she distinctly recalls that her right foot commenced to twist and turn in a very queer, uncontrollable manner. This state of affairs persisted for some time when her hand and arm, in an insidious, but certain



FIG. 2. Case of *Dystonia musculorum deformans*, showing extension spasms of neck muscles and effort of patient to check them.

way, commenced to share in these peculiar, involuntary movements. Thereafter, within a period of three years, there ensued an invasion of the musculature of the back and neck, with rapid involvement of the extremities on the left side. The patient volunteers the information that a period of three to four years ensued before the complete development of the malady took place. Her previous history, as heretofore stated, sheds no light on the curious phenomena which the patient presents. There are no menstrual disturbances. The family history is also barren of information. She has several brothers and sisters who are perfectly normal in every way, nor has

there been any affection of this type noted in the collateral branches of the family.

Attendance at school was manifestly impossible. A friend, however, interested herself in the patient and gave her one and one half years of instruction in the elementary branches. She was an apt pupil and learned readily. Her condition precluded her from using a pen or pencil but recently she acquired a typewriter, at which she has become quite an adept.

Status Præsens.—Patient is lying on left side in which position she seems most comfortable. The constant, abnormal, involuntary movements producing, alternately, muscle hypertonus and hypotonus produce bizarre attitudes and materially interfere with her comforts. These bodily contortions and spasms increase the concavity of the spine to such a degree, at times, that the shoulders and hips are drawn towards each other in a very pronounced manner, giving the patient a typical, "dromedary" attitude. The head held in tonic extension by the contraction of the posterior neck muscles adds to the grotesque ensemble.

The upper extremities show no deformities or faulty attitudes in the shoulder or elbow joints. The fingers, however, assume flexion contractures involving the proximal phalanges. Movements of a paralysis agitans type affecting the fingers of both hands can readily be seen. The lower extremities are flexed at the hip and knee. The right foot is markedly inverted and extended. The left foot is extended only. The phalanges are sharply flexed increasing to a great extent the very marked concavity present in the plantar arch, producing the so-called "semi-lunar" foot.

The gait has certain startling characteristics which merit detailed description. While assuming the characteristic "dromedary" type, the peculiar attitude of the patient and the clumsy attempts to affect a balance with the aid of the extended hand, the distortion of the trunk and legs and the waddling incidental to the walking remind one of a trained Simian. The phases of progression are somewhat dissociated due to the effort of the patient to finish with an unpleasant task and to the severe torsion and flexion of the trunk and extremities. The plantar surface of the feet do not touch the floor either when the patient stands or walks. Instead the dorso-lateral aspects of both feet are used for these functions. The existing deformity is immeasurably increased whenever use is made of the feet in standing or walking. It might be of additional interest to mention that walking, unaided, is only possible a half dozen paces.

Apraxia.—All purposeful movements are performed in a normal

manner. The patient can dress herself, comb her hair and perform small services incidental to taking care of herself. As stated before she has learned to typewrite with considerable skill.



FIG. 3.

FIG. 3. Case of Dystonia musculorum deformans, showing paraplegia and "semi-lunar" deformity of the feet.



FIG. 4.

FIG. 4. Case of Dystonia musculorum deformans, showing kyphoscoliosis of spine and torsion of pelvic girdle.

Abnormal, Involuntary Movements.—There are constant, rhythmical spasms which, apparently, never cease. When one group is in a state of relaxation others immediately assume the burden of keep-

ing the body in constant motion. To state that the muscles are relaxed does not truly explain the status. They are apparently quiet but their hypertonicity is obvious at a glance. The relaxation or hypotonia is apparent, not real. The entire somatic musculature seems to be constantly convulsed by the unceasing contractions of the various muscle units—the muscles of the neck, the muscles of the back, pelvis, abdomen, upper and lower extremities, all, individually and collectively take turns in keeping up the ceaseless motor unrest. The advent of sleep, only, halts this bizarre activity. As soon as the patient awakens the muscles almost eagerly resume their abnormal behavior.

Coördination.—Coördinative acts of various types were imperfectly performed due to the lack of voluntary, motor control. The paradoxical or reverse phenomena of dystonia, as described by Ramsay Hunt, was easily elicited.

Reflexes.—The reflexes were elicited with a good deal of difficulty. They were somewhat diminished. This is matter of conjecture, however, as the tonic spasm prevented true reflex activity. No pathological reflexes were demonstrable.

Muscle Strength.—There was apparently no gross motor weakness present. All types of muscular effort were performed in a fairly normal manner. The limitations imposed upon these acts by the tonic spasm naturally interfered with their smooth performance.

Abnormal Associated Movements.—There are no demonstrable abnormal associated movements.

Muscle Status.—There are no hypertrophies or atrophies present. The general appearance of the muscle, however, shows extremely poor development and is particularly marked in the lower extremities which by contrast with the upper extremities appear quite atrophied. The electrical reactions show no variations from the normal.

Nerve Status.—There are no demonstrable abnormalities noted in the peripheral neural apparatus.

Sensory Examination.—This shows perfect acuity in localization and discrimination for all types of sensory reactions.

Cranial Nerves.—The cranial nerves were carefully investigated and found functionally intact. There is a suggestion of a slight exophthalmos and an inconstant Von Graefe's sign.

Systemic Examination.—The general physical examination of the patient revealed no variations from the normal.

Laboratory Examination.—All laboratory tests have yielded uniformly negative results.

Mental Status.—The patient is bright, intelligent, coöperates readily in the examination and apparently shows no emotional or psychotic disturbances. She does not seem at all disturbed by her condition and displays considerable fortitude in spite of the distressing malady from which she is suffering.

Conclusions.—A summary of the clinical features of this case shows that the patient at a very early age manifested peculiar, involuntary movements—at first limited to an extremity and then gradually and definitely over a period of several years, various muscle units affected a disposition to behave in this abnormal manner. At present—ten years after the onset—the entire body seems to be convulsed in a relentless dystonia. Evidently no further progress is possible unless it be the muscles innervated by the cranial nerves which thus far have escaped. This is in accord with most writers on the subject who have emphasized the absence of cranial nerve involvement. That these, however, may also be implicated in their supranuclear pathways has definitely been established by several authenticated observations. The racial predilection, *i.e.*, its limitation to offspring of Polish or Russian Jews is not without interest. The vulnerability of the nervous system in this race to certain types of degenerative diseases is thus accentuated.

The pathology and mechanism of these strange motor distortions were for a long time clouded in obscurity. Recently, however, a good deal has been written on the subject which, in the main, seems to indicate that affections of the corpus striatum produce syndromes which show as their dominant characteristics, abnormal, involuntary motor activity, "with marked interference in those coördinating and inhibiting influences which regulate muscle tonus" (Hunt). Thomalla,¹¹ recently in a thorough, pathological study of one of his cases of dystonia musculorum deformans that came to autopsy has abundantly verified this. That the dystonia under discussion presents in an exquisite manner this syndrome is quite evident. In the light of its definite pathology this heretofore curious involuntary muscle activity gradually unfolds the cause of its mechanism and thus interprets itself as a definite, clinical entity with a pathology to prove the correctness of its underlying, organic basis.

160 West 59th St.

370 Central Park West.

¹¹ C. Thomalla, Ztschr. f. d. ges. Neurol. u. Psychiat., Juni, 12—1918, Heft XLI.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

THE THREE HUNDRED AND EIGHTY-FIRST REGULAR MEETING,

HELD AT THE ACADEMY OF MEDICINE,

MAY 4, 1920

The President, DR. WALTER TIMME, in the Chair

PRESENTATION OF A CASE OF EPILEPTIC SEIZURES, TRANSIENT HEMIPLEGIAS AND TEMPORARY PAPIL- LEDEMA OF DOUBTFUL ETIOLOGY

DR. THOMAS K. DAVIS showed a patient who had had typical epileptic seizures since her eleventh year. There was usually temporary weakness of the right side after an attack. She was brought to Bellevue after an especially severe attack where her condition was diagnosed as a straight case of epilepsy. On the tenth day however she awoke with a severe hemiplegic condition on the right side with a partial motor aphasia. The fundi were considered normal on the day that the hemiplegic symptoms developed, but forty-eight hours afterward a papilledema was found on the right and a blurring of the disc on the left. The papilledema did not continue so the etiology of a neoplasm with a hemorrhage into it had to be abandoned. A month after the onset of the hemiplegia she had recovered the motor function of the right side, and was able to walk without support.

In reviewing the possible causes for this papilledema, ethmoid sinus infection was ruled out by absence of fever and by negative findings of the nose and throat. No edema or other signs of acute nephritis had been observed in the patient and the high tension cardiac changes were also lacking. Epidemic encephalitis did not seem probable since there was no somnolence, no ocular palsies occurred, and the patient had no fever. Finally Dr. Davis called attention to the glandular make-up of the patient, pigmentation and evidence of suprarenal deficiency, with gonadal deficiencies also, and suggested a possible etiology in focal compensatory changes in the pituitary gland causing temporary pressure on the third ventricle with resultant swelling of the optic nerve heads. (This paper will appear in full in an early issue of the Journal.)

DR. WALTER TIMME said in discussing the case presented, that transient hemiplegias with lowered blood pressure did occur in his experience, but that the patients were usually in their fourth decade. The hemiplegias were recurrent. The individuals usually showed low blood sugars, low hypotension, *digiti mortui*, in short it was a spastic terminal blood vessel situation, possibly analogous to a condition in the brain. Raynaud's disease in its transitory psychic disturbances with hemiplegia resembles this. The transient hemiplegias cannot be helped by raising the blood pressure.

DR. FOSTER KENNEDY who had had the patient under observation also explained that the severe papilledema had caused them to suspect brain tumor. It then cleared up unexpectedly. Hemiplegias had occasionally been observed in young persons after great fatigue; and might be explicable on a basis similar to Dr. Davis' theory, as such cases usually cleared up rapidly.

DR. GREGORY STRAGNELL (by invitation) asked whether a tumor of the cystic variety might not be present. He recalled a case with the history of epilepsy in which autopsy revealed a cystic tumor. This would occasionally recede and the pressure symptoms would also recede.

DR. DAVIS in reply to Dr. Timme said that the patient presented mentally the typical epilepsy type. No acute episodic psychic disturbances were apparent.

AN UNUSUAL CASE OF EPIDEMIC ENCEPHALOMYELITIS

DR. WALTER M. KRAUS presented the case of a riveter, aged thirty-two, who was admitted to Bellevue Hospital on February 23, 1920, complaining of pains and weakness in the shoulders and arms. These pains he had had in the shoulders and arms for three to four weeks prior to admission. They were increased by movements. Soon after the onset, weakness of the upper extremities became noticeable and finally compelled the patient to stop work on February 10. He noticed diplopia one week before admission.

On admission there was weakness and tenderness of the muscles of both arms from the deltoids down. There were fibrillary twitchings (paralysis of the long respiratory nerve of Bell to the serratus magnus). Some winging of the left scapula was also present. The weakness was generally greater on the right than on the left. This may have been due to the fact that for twenty years the patient had been accustomed to carry heavy pieces of iron on the right shoulder. The pectoral muscles were strong. There was a slight weakness of the muscles supplied by the left seventh cranial nerve, and a mask-like expression. There were nystagmoid movements of both eyes to right and left. Tremor of the eyelids, tongue and hands was present.

Reflexes.—The triceps jerks were absent. Biceps ++ R. L. Supinator jerks present, right and left. The other reflexes were normal.

There were no sensory changes beyond the pain noted and no incoördination.

On April 26 the diplopia was still present. March 1, sleepiness very marked and hard to control. March 4, atrophy and tenderness of both infrapinati noted. W.B.C. 10,400. Polymorphonuclears 60 per cent. March 13, the tenderness in the shoulders has gradually gone and there is now tenderness in the hands. March 17, pill rolling type of tremor noticed in both hands. March 18, the gait is shuffling. Conjugate movement of both eyes downward poorly done.

Laboratory Findings.—Spinal fluid on admission, 40 cells. Globulin. Colloidal gold .0000121000. Wassermann negative.

Present Status.—Slight left facial weakness. Complete paralysis of the right serratus magnus and partial paralysis of the left serratus magnus (winging). Electrical reaction, complete R.D. in the right serratus magnus. All the other muscles of both arms, forearms and hands showed a partial R.D. There were fibrillary tremors, atrophy and weakness of all the muscles of both upper and lower extremities. In brief, a case of acute epidemic encephalomyelitis showing among other signs the results of involvement of the anterior horn cells of the lower cervical (5, 6, 7, 8) and first thoracic spinal segments.

DR. BERNARD SACHS expressed the opinion that this case corresponded to polioencephalitis with descent of the process into the upper centers of the spinal cord. Since the toxin was selective all sorts of symptom combinations were to be expected. He was interested to know whether there would be recovery in this case. A progressive atrophy he had found to be the usual outcome.

DR. FOSTER KENNEDY found the question of how the disease germ might have made its entry interesting in the light of the patient's occupation. He wondered whether the riveting occupation might not be correlated with some weakness in the muscles required for the work.

DR. ISAAC STRAUSS said that but for encephalitis lethargica epidemic this case would have been considered poliomyelitis. The anterior horn cells had apparently been affected. In poliomyelitis the histologic process would be very extensive and would be distributed over a vast area, while the parts affected may be widely separated. That the bulbar signs are lacking in this case is not an unusual occurrence. This was the first case that Dr. Strauss had seen in which the cells of the cord had been picked out to such an extent.

DR. STRAGNELL (by invitation) referred to Dr. Kennedy's discussion of the relation between the occupation of the patient and the form of his affliction. According to Adler the occupation was determined by an initial organ inferiority. The fact that the riveter had a mole on the particularly affected scapula was of interest. The occupation as a riveter should be regarded in the light of an overcompensation.

DR. KRAUSS in reply to a question as to whether he had considered Aran Duchenne atrophy said that this was ruled out by the peculiarities

of the case, acute onset, complete reaction of degeneration, facial palsy fading into the usual picture of progressive atrophy. The complete degeneration in the serratus was very interesting. Cells in the cervical segment had been selected. They were unchanged in other segments.

DR. KENNEDY then spoke of the differential diagnosis between progressive atrophy and amiotrophic lateral sclerosis (Dana) produced by syphilis. The conventional type was produced by external infection. Dr. Sachs described the manner of onset. The patient was normal up to the point of the febrile attack, and worked with a fever. The illness began with an acute infection.

DR. WALTER TIMME suggested an old syphilis as producing an Aran Duchenne type of atrophy. Dr. Sachs emphasized that it was not an Aran Duchenne type of atrophy because it was not of slow onset. Moreover it was asymmetrical, which the Aran Duchenne atrophy never is.

DR. ABRAHAMSON learned from questioning the patient that he was in the habit of carrying heavy beams on one shoulder or the other. This, Dr. Abrahamson pointed out, was the typical way of acquiring serratus palsies and this fact should explain its unusual occurrence in this case of encephalitis lethargica.

MYOTONIA ACCUSATA

DR. I. ABRAHAMSON presented a patient who had been shown two years before by him as an interesting example of myotonia accusata. The condition was of six years duration, no illness preceded the onset, the patient was simply unable to move as quickly as before, and found that he could not swallow. The initial movement was always difficult, and at the present time this was one of the few symptoms retained. The patient could clench his fist but an additional effort was required to unclench it. The Erb sign still continued. When the tongue was pressed a distinct ridge lasting for several seconds could be evinced. The treatment had been $\frac{3}{4}$ grain of thyroid daily, and 45 grains of calcium lactate. Under this treatment the patient had overcome his clumsiness and was able to work.

Dr. Abrahamson called attention to the fact that the left sterno mastoid was beginning to waste, and remarked that certain myotonias of Thomsen merge into myotonia atrophica.

THE MOTOFACIENT AND NONMOTOFACIENT CYCLES IN ELEVATION OF THE HUMERUS

DR. BYRON STOOKEY read a paper in which the results of his investigations on the muscles which act in the elevation of the humerus were set forth. Heretofore it had been generally accepted that the deltoid raised the arm approximately to a right angle and the elevation was

completed by scapular rotation. His study made by means of radiographic plates proved that the deltoid without rotation of the scapula was unable to raise the humerus beyond 60° . From this height to about 115° scapular rotation was called into play, and finally the elevation from 115° to an approximate straight angle was completed by the deltoid. The deltoid accordingly acts first as abductor, then after the scapular rotation has raised the arm over the intervening 55° from 60° to 115° , the deltoid acts as adductor for the rest of the distance.

The elevation of the humerus is accordingly effected by alternating cycles. In the first cycle the deltoid and supraspinatus are motofacient while the scapular muscles are nonmotofacient. In the second cycle it is the scapular muscles that are motofacient, while the deltoid, supraspinatus teres major, pectoralis major and latissimus dorsi are nonmotofacient. The completing cycle again calls into play the deltoid and supraspinatus. Supplementary factors, hitherto ignored, that play an important part in this last stage of elevation, are two muscles, the clavicular head of the pectoralis major, and the coraco brachialis. These muscles participate in elevation especially when great force is required, or when there is impairment of the normal function of the deltoid. A patient in whom the trapezius muscle was paralyzed was presented in order to demonstrate how he has been able to compensate by a marked hypertrophy of the clavicular head, of the pectoralis major, and the coraco brachialis.

Phylogenetically the clavicular head of the pectoralis major is present only in the higher forms of primates. In animals that have no clavicular head to the pectoralis major, the clavicular portion of the deltoid extends mesially upon the clavicle up to the origin of the sternocleido mastoideus. The clavicular portion of the pectoralis major may therefore be considered a migration of the innermost muscular fibers of the deltoid clavicular head, consequently closely related both in origin and function.

DR. I. STRAUSS asked whether the pronounced standing out of the clavicular head in the patient might not be an anomaly of the pectoralis major.

DR. ABRAHAMSON said that in congenital absence of the sternomastoid the clavicular portion was always spared. It was interesting to note in these cases the overdevelopment of the clavicular portion.

SOME MEDICAL AND SOCIAL PROBLEMS OF CHILDHOOD DELINQUENCY

DR. SANGER BROWN, II, in reviewing the question of the medical and social aspects of childhood delinquency, spoke of a survey which is being made in one of the probationary schools in New York City, under the auspices of the National Committee for Mental Hygiene, and upon the invitation of the public school authorities.

This survey consists of a thorough physical examination of the child, a mental examination, psychological test, and a social survey of his home and environment. To carry on this work a physician, a psychologist and a social service worker have been appointed. In their inquiry as to the causes of delinquency, an attempt has been made to determine to what extent this condition arises from physical causes, mental defect, inherent personality disorder, and environmental influences.

In describing the cases so far examined, certain groups of children are found. There are the nervous children, not designated as neurotic in the way we generally describe adults, but children who show increased motor activity, decreased motor activity, lack of emotional control, such as explosive, irritable or sensitive states, and disorders of sleep. These nervous symptoms are considered benign in character and amenable to treatment. The causes are considered both physical and mental. In the physical, they may be malnutrition, over-stimulation from unsuitable food and physical exhaustion. In the mental sphere a child may become neurotic and emotional for many reasons. A child is particularly sensitive to faulty home influences,—a nervous mother, friction between parents, all of which causes social misunderstanding. The child may be unfavorably compared with another in the family and may feel a sense of failure or inferiority. Such maladjustments may of course, arise in school and they may arise from sources within the child itself,—from his instinctive life. Nervous children become delinquent because they cannot conform to the ordinary school discipline. Reasons for their irritability and emotional state are not understood, and when they are disciplined they do not improve and are likely to become truant. They associate with bad companions, and delinquency is engrafted upon a nervous state.

Dr. Brown does not consider mental deficiency as important a factor in childhood delinquency as has been often stated. The real problem of delinquency is not one primarily of mental defect, but is one of maladjustment. About twenty per cent. of this particular group were mentally defective, and with them the delinquency was a secondary feature.

The question of personality and delinquency is considered in this paper. Although in the adult delinquent one feels that the personality is primarily at fault, one does not seem warranted in assuming that delinquent children have any special personality disorders or tendencies toward delinquency because of inherent mental traits. So many causative factors are found in their environment or in their physical condition that one does not seem justified in considering the symptoms which they show as inherent. One does find in delinquent children many with special aptitudes and interests who do not get along well in the regular classes, and also children of rather dull intellect who do not like school; but they are delinquent secondarily, and not because of their mental traits. If, however, ill conduct continues over a period of some years

there is reason to believe that these traits of character become established and are very difficult to eradicate in the adult.

In the management of childhood delinquency, the need of individual study as to the needs of each case is urged from a physical, mental and social standpoint. The social attitude of the community toward delinquency is, as a rule, an unfavorable setting for the child because he receives unfavorable judgment before his case is thoroughly understood. Doubtless the main way of dealing with delinquency is by preventive treatment, and much could be accomplished by separate classes for children with special aptitudes, neurotic symptoms, and for those who cannot do the regular class work for any reason. This would tend to improve the delinquency which eventually develops in these cases, and there is reason to believe that it would also prevent considerable adult delinquency, since maladjusted children tend to drift to permanent conduct disorders unless corrected.

DR. A. A. BRILL opened the discussion with an appreciation of the presentation of the material. There was little that was new, but the fact that only twenty per cent. of the delinquents were mental defectives was rather surprising. Dr. Brill thinks that in the diagnosis of mental defectives, students of these problems have confined themselves too closely to the discovery of intellectual deficiencies, but whereas a great many delinquents are intellectually quite normal, the difficulty lies in their emotional makeup. It is a thymic rather than a psychic disturbance. This not only holds true in delinquents, but in many other abnormal states. Therefore, he would call the individuals showing preponderantly emotional derangements thymopaths and not psychopaths. If we could study the emotions of these delinquent children something might be attained. To attempt to judge an individual through an intellectual examination is quite useless.

DR. MICHAEL OSNATO stated that he had enjoyed the paper very much in the capacity of a parent. He felt that the schools themselves needed a survey and reorganization. One of his sons had had his sixth teacher in the course of the year, another had had several teachers in one subject. The boys had threatened to stop attending that school if these conditions did not improve.

DR. C. E. ATWOOD emphasized the importance of ascertaining from the child's makeup what his constructive possibilities as well as deficiencies were, so that the former might be utilized to the full in his development, while the latter, as far as possible were being corrected or ameliorated. In a long series of personality studies of exceptional children of the public schools of New York, selected by Miss Elizabeth Farrell, superintendent of ungraded classes, special attention was paid to this idea with gratifying results.

DR. BERNARD SACHS said that it was evident from the study presented that grouping of delinquent children is just beginning. There are interesting results in prospect. The causes for delinquency are

recognized to be numerous. The schools are not perfect, but improvements are under way. Improvement of the physical condition of school children in view of the startling amount of malnutrition in children of school age will have to be brought about among other measures by the proper compulsory school lunch. The teaching in the schools will undoubtedly have to be improved. The schools must be made more interesting. In private schools there seems to be less delinquency, and this is not due wholly to better environment. If the teachers can be improved, then the parents, and finally the environment, Dr. Sachs feels that the children will naturally follow.

DR. F. J. FARNELL, of Providence, R. I., described the problem as it exists in his city. A clinic was instituted for the examination of any child showing signs of mental defect. There were eight disciplinary schools in the beginning, and two schools for retarded children. At the present time there are three disciplinary schools, fifteen for retarded children, and three fresh air schools. Two special schools for adolescent girls, many of whom require special attention for disorders incident to puberty, have been started. The teachers are all duly qualified, having taken special courses elsewhere. Every case is discussed with the teachers, and a general atmosphere of coöperation and understanding is created. The decrease in delinquency has been striking. Cases of delinquency on the grounds of truancy now are referred to the clinic.

AN EMOTIONAL CRISIS. A DESCRIPTION AND ANALYSIS OF A SITUATION THAT AROSE AMONG PSYCHOPATHIC DELINQUENT WOMEN

DR. EDITH R. SPAULDING told of the opening of the psychopathic hospital of the Laboratory of Social Hygiene at Bedford Hills. The attempt was made to treat the patients as though they were in a psychopathic hospital that had no connection with a reformatory institution. Sources of irritation were removed and the patients were helped to make the necessary adjustments to make it possible for them to live in a social group. The various known methods of treatment and training were installed. None of the punitive measures usually practiced in reformatories were used unless it was necessary to segregate an individual patient who would disturb the equilibrium of the group.

An unfortunate personal quarrel among five of the girls in which they gave vent to their emotional feelings by creating a general disturbance led to a change in the method of management of the institution. The final solution, Dr. Spaulding stated, of this very intricate problem would never be found in therapy alone, in education alone, in self-government alone or in discipline alone. The solution would be in the utilization of all these resources by those who had made a close study of the problem. It was urged that all neurologists and psychiatrists contribute their support in an effort to solve this problem, one of the most difficult of all social problems.

DR. BRILL, after expressing his interest in the paper, said that it is a question whether apomorphine and hyoscine in judicious doses on the ringleaders could not have quelled the riot in its incipency. A riot in the workhouse similar to the one Dr. Spaulding described had been quieted very rapidly by these means.

DR. I. J. SANDS, of Brooklyn, said that the episodes described by Dr. Spaulding were characteristic of psychopathic individuals, and were often met with in hospitals for the insane such as the Manhattan State Hospital at Ward's Island. Many constitutionally psychopathic individuals and quite a number of epileptics are committed to the State Hospitals because of unpleasant effects associated with their episodes of excitement or with their epileptic seizures. In the intervals they are fairly rational. These mental upsets are to be treated in a medical manner. Mild sedatives, such as sodium veronal, or luminal in very small doses, and mechanical restraint, such as dry packs, have proved very useful in the control of these outbursts. The latter has the additional advantage of having a great psychic effect on the other patients. No institution of the type described by Dr. Spaulding should be run without a competent and well-trained psychiatrist and a properly trained corps of nurses. The problem described is essentially medical and psychiatric and should be so treated.

DR. OSWATO reported that he had heard that the Bedford Hills experiment had proved a failure. These patients are like spoiled children and many of them cannot be reached at all except by disciplinary correction. This same condition was found to be especially true in the army and with hysterics most notably.

DR. SPAULDING said that the difficulty with hospitals for delinquents was that among these patients the herd instinct was much more evident than among patients in the ordinary mental hospital where each patient is more or less engrossed with his own troubles. A disciplinary system involving deprivation of privileges was used after the episode described had occurred.

Current Literature

I. VEGETATIVE NEUROLOGY

1. VEGETATIVE NERVOUS SYSTEM.

Knauer, A., and Billigheimer, E. CONCERNING ORGANIC AND FUNCTIONAL DISTURBANCES OF THE VEGETATIVE NERVOUS SYSTEM WITH SPECIAL REFERENCE TO FEAR NEUROSES. [*Ztsch. f. d. ges. Neurol. u. Psychiat.*, 1919, Vol. 50, p. 199.]

Various clinical observations (principally unilateral disturbances of the vegetative nervous system) are compared and analyzed for the purpose of obtaining insight into the neurotic functional changes and the connection of these disturbances with the processes of the inner secretions, as well as to determine the anatomical arrangement of the paths concerned. The authors' conclusions are as follows: In human beings, as in cats and guinea pigs a part of the fibers of the cervical sympathetic pass through or near the middle ear. The part of the cervical sympathetic fibers united in the carotid plexus may be involved by injuries in the temporal lobe extending to the base of the skull. From the middle ear powerful reflex stimulations can be produced in the paretic cervical sympathetic and these may extend to the trunk sympathetic. The cervical sympathetic conducts fibers which dilate, as well as those which contract, the facial vessels. There is no doubt that the sweat secretion can be both stimulated and suppressed by the sympathicus. In the authors' cases some new facts were brought to light which go to show that pilocarpine sweating does not depend on the sympathetic, as does the nervous secretion of sweat. There are probably long paths in the medulla oblongata for the vasomotor apparatus as well as for the sweat glands. The vasomotor reactions of the skin and the exanthematous and trophic reactions of the same to certain drugs are controlled from the contralateral side. It is probable that for the vegetative center of each half of the body there is a secondary nervous apparatus which, if equilibrium is destroyed, automatically restores it. There are individuals who can to a certain degree, voluntarily set their vegetative organs into activity. These are probably always hysterics and degenerates. A somewhat similar phenomenon takes place in hypnotism. There are no pure vagotonias and sympatheticonias in the sense of Eppinger and Hess. Vagotonic and sympatheticonic symptoms often exist side by side in the same individual, or there may be diminution of tone in either system which in no way produces an antagonistic hyper-

tonus in the other. The vegetative neurotic symptoms may be due to congenital inferiority, to toxic disturbances, especially of inner secretory nature (Basedow), or to serious emotional shock and perhaps to extreme bodily fatigue. The greater part of the vegetative disturbances following fear neuroses are in the form of stimulation or paralysis of the sympathetic—acceleration of the pulse, arrhythmia, changes in the dilatation of the pupils, abnormal sweating, blushing, weakness of the bladder, whitening of the hair, etc. To functional changes in the vegetative system, especially of the sympatheticus, are probably to be referred many motor phenomena, especially some forms of tremor (Basedow's tremor) and functional heightening of the reflexes, confirming the view that the reflex tonus of the striated muscle is restricted by the sympathetic. Affective experiences probably have a much greater influence on the blood glands than has hitherto been suspected. In addition to neurogenic glycosuria Basedow also refers to a glycosuria from anxiety. Disturbances of metabolism of fat (acetonuria) and increased destruction of albumin may be produced by the emotions, due to stimulation of the suprarenals. The anxiety glycosuria is always a transitory phenomenon. True fear neuroses may often be distinguished from degenerative hysteria and psychopathic conditions and from the more frequent psychoses by the remarkably low diastolic blood pressure immediately after the trauma. [J.]

Schwartz, L. DERMOGRAPHISMUS AND VASOMOTOR DISTURBANCES IN PSYCHONEUROTICS AND INDIVIDUALS WITH SOUND NERVES. [D. Zschr. f. Nervhkl., 1919, Vol. 60, p. 279.]

This is a continuation of an article by this author which appeared in the above periodical in 1917. The writer studies the effect of age (there being a pronounced reaction between 16 and 25), sex, external temperature (moderate variations of this show an effect only for dermographia peripherica, and not for dermographia dolorosa), psychical influences. In psychoneurotics, dermographia dolorosa is in general more pronounced than in persons of healthy nerves; the same is true for dermographia peripherica. A peculiarity in psychoneurotics is the appearance of islands at the side of the stimulus streaks, especially in dermographia dolorosa. A reaction breadth of more than 3 cm. is never found in healthy individuals. Among those classed as non-nervous individuals the degree of dermographismus paralleled minor nervous difficulties, such as cold hands and feet, cyanosis of the hands, perspiration of hands and feet, headache, sleep disturbances, trembling of the fingers. Repeated examination of dermographia dolorosa on different days revealed a variability in neurotics that was not found in healthy individuals. The neurasthenic showed more pronounced reactions in dermographia dolorosa than the hysteric. The behavior of the dermographia dolorosa corresponded in many respects to the results of plethysmographic and tonometric examinations. [J.]

Linhart, George A. THE FREE ENERGY OF BIOLOGICAL PROCESSES [Jour. of General Physiology, Jan. 20, 1920, Vol. 2, p. 247.]

The object of this investigation is to learn (a) whether life processes obey the laws of thermodynamics as do physical chemical processes, and (b) to study the rates and mechanism of life processes at different temperatures and especially at extremely low temperatures, that is, in the temperature range of liquid hydrogen, or at about -250° C. This latter study is of especial interest, for, according to recent theories which are well substantiated by experimental facts, the phenomenon of color is due to the vibrations of the chemical units composing the colored substance (electrons, atoms, groups of atoms and molecules), vibrating at different but definite frequencies. Now, there is a great deal of experimental evidence showing that all substances gradually give up their kinetic energy with fall in temperature and that in the neighborhood of the absolute zero, or -273° C., their kinetic energy is zero. Hence, the chemical units can no longer vibrate. What now is their color? In a paper (now at press) demonstrating a new law of thermodynamics it is shown that near the absolute zero (-273° C.) all substances thus far investigated obey the law "black body radiation." Shall we venture to guess then that the color of all substances at this low temperature is black? This most fascinating subject will form part (c) of our present study. [Author's abstract.]

Straus, S. G. THYROIDAL CONSTIPATION. [N. Y. Med. Jl., Feb. 14, 1920.]

The individual varies one from the other, therefore his disease and its cure also.

Constipation is regarded as delayed evacuation of intestinal contents frequently associated with quantitative deficiency and qualitative alteration of the fecal mass. We have learned of many types of constipation and their various causes and have suggested many ways of treatment. But despite all these means, we often fail to cure. Why? Because we tried local remedies for constitutional symptoms. We must go deeper. We must forget the bowel and think of the patient's biologic soul. Assume the endocrinologic viewpoint. Study the glands of internal secretion, a few years ago a novelty, now common knowledge.

Prophylaxis is the watchword today. With our knowledge of the endocrine glands and their physiology, the subjective and objective symptoms which show slight derangements can be remedied before they become a complete picture of endocrine pathology, when they would no longer respond to our therapy.

The literature mentions thyroid therapy for constipation, but so empirically that the busy practitioner may be tempted to use this idea in the same haphazard way as he does with cathartics.

Only a case of thyroidal disbalancement justifies this new means.

The thyroid gland acts not only through inherent qualities, but by influencing some other glands of internal secretion. This exerts happy results.

Thyroid extract is to be used only after establishing the diagnosis of thyroidal disbalance. Although not proven as yet by the laboratory, there are quantitative and qualitative marks to go by. Briefly:

Mental signs: Sluggishness at times, alternating with sparkling wit. Irritability, worse at slight provocation. Moodiness generally. Inability to concentrate; forgetful; easily tired; confidence lacking; heavy dullness in morning; wears off with day. Requires much sleep.

Hair: Usually coarse, dry. Tendency to come out; dandruff likely; lacks brilliance; dusty.

Head: Liability to generalized dull aching on slight effort. Headaches frontal or occipital.

Eyes: Eyebrows tend to sparseness, especially outer third. Skin scaly under eyebrow. Upper lid puffy, particularly outer half. Eyelashes sparse. Orbit often seems sunken, enophthalmic. Dull expression usually to eye. Iris pigment usually hazel or grey green, rarely clear color like brown or blue. Pupils tend to be narrow.

Nose: Tendency to rhinitis. Crusts frequently.

Ears: Scales form easily along external auditory meatus.

Mouth: Lips tend to dryness and cracking. Tongue thick, stubby. Teeth often leave imprint along margin.

Teeth: Heavy, soft, easily carious. Tend to yellowish stain. Liability to pyorrhea.

Tonsils: Tonsillitis attacks frequent. Tonsils usually enlarged.

Respiratory system: Frequently acquire cold; recovery difficult. Tendency to winter bronchitis, usually associated with productive cough. Adenoid tissue overgrowth likely in children.

Cardiovascular systems: Cardiac rhythm steady, sluggish. Not affected easily by physical or emotional stress. Rate tends to be slow—around sixty. Systolic pressure unchanged, pulse pressure usually less than normal. Extremities usually cold; may be damp. Poor capillary circulation shown by refilling of skin capillaries after pressure. No stimulation reaction after cold baths. Usually takes only warm or hot baths. Feels much better in warm weather. Winter often makes him utterly miserable. Vasomotor skin reaction and pilomotor skin reaction very sluggish. Both may be absent. Temperature usually subnormal.

Digestive: Appetite usually not large; sometimes extreme; even then easily satisfied. At times craves sweets. All food agrees. Tendency to tasteless gaseous eructations after meals and meteorism and offensive flatus. Tendency to thickening of rectal veins with bleeding. Tendency to gain weight rapidly. Desire to sleep after meals.

Urinary: Tendency to polyuria. At times slight traces albumen and sugar. Indican frequently excessive. Nocturnal enuresis often present.

Skin: Dry. Thick. Tends to scale easily; often shows psoriatic and eczematic patches. Tendency to small warty growths. Perspires with difficulty. Yellowish earthy color. Fingers and toes often seem cyanosed. Fragility of nails, show ridges and thickening.

Skeleton: Relaxation of ligamentous structures. Cracking noises on motion of small joints.

Determine if patient belongs in this group.

Begin with doses of one tenth grain of thyroid extract. This dose once a day for a week and result noted. Important to mention if constipation is unchanged, one or more other symptoms equally important in their thyroïdal bearing may be bettered or cured. If so, repeat another week, for it means improvement. The constipation may be the last symptom cured.

If a small dose does not affect, increase quantity to one grain, etc.

If bowel remains inactive for thirty-six hours use small saline enemata. No dietary restrictions. Stop thyroid extract when intestinal action is normal. [Author's abstract.]

Harvey, E. Newton. STUDIES ON BIOLUMINESCENCE. X. Carbon dioxide production during luminescence of *Cypridina* Luciferin. XI. Heat production during luminescence of *Cypridina* luciferin. [Journ. General Physiol., II, pp. 133-143.] XII. The action of acid and of light in the reduction of *Cypridina* oxyluciferin. [II, pp. 207-213.]

Previous research has shown that light production by animals is due to the oxidation of a substance luciferin in presence of an enzyme luciferase, and that *Cypridina* luciferin, the oxidizable material of *Cypridina*, is in all probability related to the peptones, while luciferase is probably an albumin or very closely associated with an albumin. Evidence has also been presented to show that the oxidation product of luciferin, which is called oxyluciferin, has properties similar to luciferin itself and represents only a slight oxidative change, not a fundamental splitting of the luciferin molecule. The oxyluciferin can be readily reduced to luciferin again by various reducing agencies, among them the nascent hydrogen produced by action of acids on metals. Acid favors the reduction of oxyluciferin, and alkali favors the oxidation of luciferin.

The three present papers deal with CO₂ and heat production and the general nature of the oxidative process. Carbon dioxide production was tested by determining of any change in acidity, which might come from CO₂ produced, occurs when solutions of luciferin and luciferase are mixed. After several attempts to measure acidity by adding an indicator (thymol-sulphone-phthalein) to the solution, this method was given up because the luciferin and luciferase solutions are yellowish in color, and the electrometric determination with the hydrogen and N/10 KCl calomel electrode was used. The acidity of the luciferin solution, luciferase solution, and the two after mixing was found to be the same,

$P_H = 9.04$. Therefore, not enough CO_2 is produced to affect the H-ion concentration.

As both luciferin and luciferase solutions contain proteins, and as luciferase is certainly and luciferin probably a protein, it will be seen that their buffer value is relatively high. The experiments show that not enough CO_2 is produced during luminescence to saturate the proteins in solution, including luciferin and luciferase themselves. The reaction responsible for luminescence, the oxidation of luciferin, is therefore not to be compared to the reactions in cells giving rise to the carbon dioxide of respiration.

The production of heat during luminescence was determined by bringing solutions of luciferin and luciferase to the same temperature and then mixing them. Any increase or decrease of temperature which occurs during the luminescence which results from mixing can be measured and some idea of the heat of oxidation of luciferin can be obtained. It was found necessary to bring the luciferin and luciferase solution to temperature equilibrium in two separate tubes within one thermos bottle, and to mix the solution by breaking the tubes. Two thermo-couples of copper-advance wire were used to measure the temperature—one in the luciferase, the other in the luciferin solution. These were connected through a copper double-throw switch with a galvanometer of a sensitivity such that 1 mm. deflection represented a temperature change of 0.003°C . As mixing the solution heats them slightly, control experiments with water in each tube were carried out.

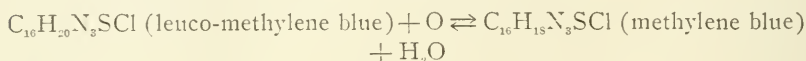
With both control (water) and luciferin experiments there was a slight rise in temperature on mixing the liquids in the two tubes. The average rise of 5 control (water) experiments was 0.0054°C . and the average rise of 5 luciferin experiments was 0.0048°C . The difference in the average rise of control and of luciferin experiments is so small (0.0006°C .) as to have little significance. It is therefore concluded that if any temperature change occurs during the luminescence reaction it is certainly less than 0.001°C ., and probably less than 0.0005°C ., too small to be measured by this method.

To prepare the luciferin solution 22 grams of dried Cypridina were dissolved in 20 c.c. hot water and 10 c.c. of this 10 per cent. solution were used in the thermos bottle in the experiments. Assuming that 1 per cent. of the dried Cypridina is luciferin, 0.1 gram of luciferin on oxidation was not able to raise the temperature of the 10 c.c. (in reality 11 c.c., since 1 c.c. luciferase solution was mixed with the 10 c.c. luciferin) of solution 0.001°C . This means that 1 gram luciferin liberates at least less than 0.1 calorie during the luminescence accompanying oxidation.

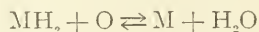
It is because of the small energy change during oxidation of luciferin that the reaction may be so easily reversed and oxy-luciferin reduced. Most of the reducing methods involve reduction in acid solution or in a solution which becomes acid. Acid alone will cause a

slight reduction and this is a function of the H-ion concentration, since any acid added to oxyluciferin will cause a slight reduction to luciferin. The change begins when the solution is about neutral, $P_H = 7.1$. Acid is not essential for reduction, however, as reduction can occur in alkaline solutions which generate nascent hydrogen, as on addition of Al, and NaOH, or merely on mixing oxyluciferin with finely divided Al, Zn, or Mg, or in the presence of NH_4SH .

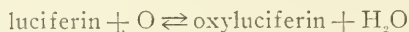
Since all the reducing methods which may be used with oxyluciferin will also reduce methylene blue to its leucobase, the author uses this reaction as a type to explain what happens when luciferin is oxidized. As methylene blue contains no oxygen, its reduction consists in the addition of 2 atoms of hydrogen. When leuco-methylene blue oxidizes, which it does spontaneously in air, water is formed by the union of these 2 atoms of hydrogen with oxygen, thus:



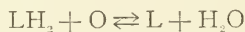
For short,



Writing the luminescent reaction in a similar way, we have:



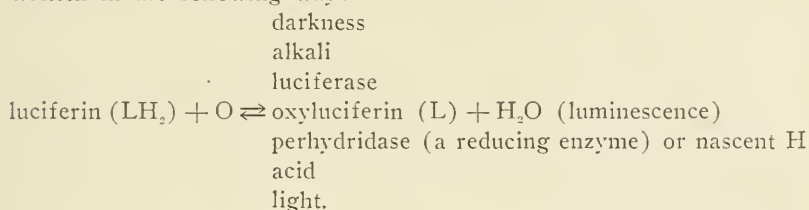
For short,



If we assume that the LH_2 (luciferin) compound is dissociated to even the slightest extent into L and hydrogen, the hydrogen ion will shift the equilibrium toward the formation of that substance which involves the taking up of hydrogen. Consequently, a partial formation of luciferin can be obtained by adding an acid to oxyluciferin. Reduction of the H-ion concentration tends to shift the equilibrium in the opposite direction. Consequently, addition of alkali favors the oxidation of luciferin, and it is quite generally true that biological oxidations are favored by an alkaline reaction.

Addition of acid is not the only means of favoring the formation of luciferin from oxyluciferin. Any reaction which proceeds in one direction with evolution of light should, theoretically, proceed in the opposite direction under the influence of light. Light will cause the reduction of oxyluciferin. A tube of oxyluciferin exposed to sunlight for 6 hours or the mercury arc for 2 hours will be partially converted into luciferin. It will luminesce when luciferase is added, while a control tube kept in darkness shows no trace of luciferin. The action is more marked with the ultra-violet, as a solution of oxyluciferin in a quartz tube showed more reduction than one in a glass tube when exposed for the same length of time to the quartz-mercury arc. The reduction is not dependent on the formation of acid under the influence of light, since two

tubes of oxyluciferin, one kept in darkness and the other exposed to sunlight for 6 hours, had the same reaction, $P_H=9.3$. Some reducing substance might be formed under the influence of light, but this is not very probable. The reaction for luminescence in Cypridina may be written in the following way:



[Author's abstract.]

Adler, E. GENESIS OF ROUND ULCER. [Med. Klin., 1919, 21.]

Ulcus pepticum ventriculi sive duodeni can be the result of a neurosis of the vegetative nervous system which through psychic emotional factors can lead to an endotoxic herpetic neuritis in the mesenteric plexus. Such ulcers which tend to be very chronic and, in the constitutionally disposed, either from the neurosis or external factor, set up a vicious circle resulting in chronic gastric and duodenal ulcer.

Adler, A. CONCERNING THE LOCALIZATION OF THE BLADDER FUNCTION IN THE BRAIN CORTEX. [Neurol. Centralbl., Oct. 1, 1919, No. 19, Vol. 38.]

The frequent occurrence during the war of skull wounds with injury of the cortex has thrown new light on the problem of the cortical innervation of the bladder. Two diametrically opposite views are entertained as result of these observations; one that the bladder center is to be localized in the lobulus paracentralis, in the immediate vicinity of the leg center; the other that it is to be localized in the motor region of the hip center between the arm and leg center. The researches of the writer lead him to the conclusion that in the cortex there is one center for the voluntary inhibition of micturition and another for the voluntary emptying of the bladder. The writer cites two cases where, after wounds in the parietal region, the patients were unable to empty the bladder through voluntary relaxation of the sphincter internus, and where there was, in consequence, a regular breaking through of the urine. Comparing these two cases with cases cited by Pfeifer in which there was retention of urine, the author comes to the conclusion that the retention of urine was caused by a spastic contraction of the musc. sphincter externus as result of a lesion in the cortical center controlling this muscle, situated in the motor region in the vicinity of the hip center, between the arm and leg centers. In the author's cases there were phenomena of incontinence produced by spastic conditions which af-

fected the musc. sphincter internus. These spasms affecting the internal bladder sphincters are a result of an injury of the cortical center which controls this sphincter situated in the immediate vicinity of the leg center in the lobulus paracentralis. In the first type of cases the center of inhibition is in a condition of stimulation, the contractions of the sphincter externus last too long and cannot be controlled and as a result the passing of the urine is prevented. In the second type, it is the center for emptying the bladder which is in a condition of stimulation, micturition begins too quickly and the impulse is too urgent, so that it cannot be inhibited. The author therefore draws the conclusion, first that there is a center for the M. sphincter externus in the region of the hip center, between the arm and leg centers for the voluntary retention of urine in the bladder, or for the interruption of its flow, and, secondly that there is a center for the M. sphincter internus in the region of the leg or foot center for the express voluntary voiding of urine at the time convenient for the individual. [J.]

Pfeifer. CONCERNING CORTICAL DISTURBANCES OF THE BLADDER AND THE LOCALIZATION OF THE SAME, IN CASES OF BRAIN INJURY. [Neurol. Centralbl., Dec. 16, 1918, No. 24, Vol. 37.]

In two hundred cases of brain injury there were twenty with disturbances of the bladder. Of these seven had hemiplegia on the left side, six on the right, and in seven further cases both hemispheres were affected. The bladder disturbances were in the form of retention of urine. The patients complained of pressure of urine but they could only empty the bladder drop by drop. The disturbances lasted from several days to several months—in the majority of cases several weeks. In each hemisphere there must be a cortical bladder center, the localization of which is to be sought in the motor region of the brain cortex. All these patients had manifest motor disturbances in the form of hemiplegia, hemiparesis, or triplegia. In thirty-five cases of injury of the frontal brain there was only one case of bladder disturbance and in this case there was a whole series of injuries of other sorts which led to a hemiplegia. But there are not always disturbances of the bladder where there is unilateral paralysis. Among the two hundred patients there were sixty-four with paralysis and among these only twenty had bladder disturbances. Probably the bladder center occupies a small field which, in many cases, escapes injury, and this place must be between the arm and leg centers. According to the interpretation of some of the observations in the war this center is to be sought in the vicinity of the leg center. The author saw one case of severe paraplegia of both legs which was not accompanied by any bladder troubles. Operations were performed in all the cases of hemiplegia, and in nearly all instances the cicatrice was near the center of the motor region. [J.]

Miller, L. B. CONCERNING THE INNERVATION OF THE URINARY BLADDER. [Neurol. Centralbl., Aug. 1, 1918, No. 15, Vol. 27.]

It has been proved experimentally that stimulation of the side walls of the third ventricle and thereby stimulation of the hypothalamus produces, not only muscular dilatation of the pulse and an outbreak of sweat, but also contraction of the bladder. This place in the depth of the large basal ganglion is, in all probability, also the place from which the emotions such as anger and fear exercise their influence on the bladder. The voluntary emptying of the bladder and the voluntary inhibition of this reflex where there is pressure of urine can only proceed from the cerebrum. It is not probable that there is a special "bladder center" in the cortex by which the sympathetic musculature of this organ is directly influenced. It is probable however that through the innervation of the striated muscle apparatus in the floor of the bladder and the relaxation of the tonus of the compressor urethrae the reflex in the vegetative nervous system is set in activity which results in the expulsion of the urine, and that by strong tension of the compressor urethrae the production of such a reflex is inhibited, even where there is strong pressure of urine. The place in the brain cortex from which the striated muscles of the floor of the bladder are innervated is to be sought in the upper part of the central convolution, or in the lobulus paracentralis. This localization would explain the observations, of Kleist, *i.e.*, that after tangential wounds in the parietal region which injured the upper part of the central convolutions on both sides, there was besides paralysis of the foot, also disturbances in emptying the bladder. [J.]

2. ENDOCRINOLOGY.

Oyarzabal, E. INTERNAL SECRETIONS IN DERMATOLOGY. [Riv. d. Med. y. Cir. Pract., Dec., 1919.]

This patient, a girl of 18, began with an amenorrhea and then there developed slowly a pronounced scleroderma. He reviews the literature and points out the probable polyglandular nature of the disorder but leaves it somewhat indefinite as to just what the interrelationships may be. He discusses the general relation of endocrine disturbance to skin metabolism and endocrinotherapy still in the "shotgun prescription" stage.

Milio, G. PROGRESSIVE MUSCULAR DYSTROPHY. [Pediatria, Feb., 1920.]

This paper deals with the clinical material of nine patients from 6-11 years of age. Some infectious disease factors were present in some of the patients. No endocrine status study is apparent.

Turró, R. EMOTIONS AND ENDOCRINE FUNCTION. [Siglo Méd., Dec. 13, 1919, J. A. M. A.]

Turró explains the psychic by the physiologic basis on which it rests, not the physiologic by the psychic, as is the general rule. Achúcarro's assertions in regard to an internal secretion of the neuroglia and Marañón's demonstration that the brain can influence the vegetative life in two ways, by both nerves and blood, have thrown much light on the question of emotions. Marañón has demonstrated that it is possible to induce all the phenomena of fright, such as pallor, dilatation of the pupils, acceleration of the heart beat, goose flesh, sweating, etc., without the intervention of the brain, merely by injection of epinephrin in the artificially hyperthyroidized or in subjects with latent hyperthyroidism.

Dalché, P. ENDOCRINES AND SALIVARY GLAND. [Journ. de Med. et d. Chir. prat., Nov. 25, 1919.]

This is the history of a woman, 50 years of age, who had an enlarged thyroid and who was just passing into the menopause. In addition to her goiter, she also showed marked swelling of both parotid and submaxillary glands, accompanied by profuse salivation. In two pregnancies, twenty-five and twenty-three years previously, she had had a similar enlargement of these glands and salivation, but without any thyroid changes. The symptoms had disappeared after delivery. Hemato-thyroidin therapy seemed to diminish the thyroids and the parotid and submaxillary enlargement and salivation completely disappeared in about three months. The salivary, ovarian, and thyroid manifestations constituted a polyglandular syndrome, according to this author, and suggests that a similar treatment might be adopted in Mickulicz's disease, which may best be regarded as a polyglandular syndrome.

Sezary, P. ADRENAL INSUFFICIENCY. [Presse Méd., Sept. 22, 1919.]

Sezary has isolated three types or genera of symptoms. The first is sudden death due to a fulminating insufficiency. Next in order are the syndromic forms which comprise an acute form—the Sergeant-Bernard syndrome, the ordinary subacute, and the Addisonian form (Addison's disease), the latter being eminently chronic. Finally we see monosymptomatic forms such as myasthenia. The first mentioned form is merely one of the causes of sudden death in the midst of health and after surgical operations, anesthesia, etc., and the author says hardly anything about it. He distinguishes from it the Sergeant-Bernard syndrome because the latter is an expression of Addison's disease which sometimes develops on a background of the latter malady and again as an abortive form of the latter. Practically, however, the two acute forms must be the same, as there would be no room for two separate affections so closely related. The Sergeant-Bernard syndrome is divisible into two

clinical forms according as it occurs isolated or part of Addison's disease. The syndrome is as follows: atrocious backache and abdominal pains; repeated and perhaps incoercible vomiting; diarrhea or exceptionally obstinate constipation; prostration, hypothermia and low tension pulse; cold extremities and tendency to cyanosis and collapse; death in from 3 to 6 days and exceptionally sudden or in a few hours. This syndrome has been mistaken for acute poisoning, cholera, peritonitis, meningitis, and several other grave affections, including encephalopathies of various kinds. The same syndrome is also seen symptomatically in any grave general infection or intoxication. The typical and atypical forms of Addison's disease are now related and the author proceeds to mention bulbospinal myasthenia, otherwise the Erb-Goldflamm syndrome, the adrenal nature of which has long been suspected. However, myasthenia is itself a syndrome of which the adrenal type is only one form. Finally there is a form of muscular atrophy of suprarenal origin. Under treatment it is insisted that the test for the indication for adrena-line therapy is the ability of the latter to maintain the blood pressure when this is depressed. [Med. Rec.]

Coston, H. R. CONGENITAL TOTAL HEMIHYPERTROPHY. [Med. Record, Jan. 31, 1920.]

In this child of defective mentality, 22 months of age, with negative family history save that one maternal cousin had six toes on the right foot, there was present at birth a marked hemihypertrophy of the left side of the body.

Claude, H., and Bernard, S. GLANDULAR FUNCTION TESTS. [Bull. de la Soc. Méd. des Hôp., Dec. 19, 1919, J. A. M. A.]

Claude and Bernard have been giving organ extracts to healthy subjects and to those with various endocrine disturbances, seeking by these biologic tests to throw more light on the functioning of the different glands with an internal secretion. The responses differed widely from the normal after injection of pituitary extract in exophthalmic goiter, in hypothyroidism, and with suprarenal insufficiency. The different results obtained with organ extracts in different cases are readily explained by the varying preceding conditions in some of the endocrine glands. Among the practical results thus learned is that preliminary administration of thyroid extract or gland tissue enhances the action of the pituitary and suprarenal extracts.

Perrin, M., and Richard, G. ENDOCRINE AND TARDY EPILEPSY. [Rev. Neur., Sept., 1919.]

Late developing epileptic convulsive conditions are here reported in whom polyglandular disease seemed to be related. An idiot of 38 and a woman of 20 are described for whose convulsions ovarian treatment

seemed to benefit materially. In one of their cases they gave 10 cg. of thyroid extract and 40 cg. of ovarian extract for a month with no change in the bromide dosage. After three months the amounts were doubled. There was only one attack in all this period. The attacks had usually coincided with menstruation.

Hernando, T. GASTRIC CHANGES OF ENDOCRINE ORIGIN. [Med. Ibero, Oct. 11, 1919.]

The stomach, according to Hernando, is markedly under the influence of the endocrines, chiefly mediated by the vegetative nervous system. Asthenia or splanchnoptosis is a consequence of continued changes of this origin. Gastric secretions are modified by the endocrine glands, usually as hyposecretion although cases of hyperchlorhydria are found in persons with excessive thyroid functioning, the thyroid has a stimulating action on gastric secretion and in persons with suprarenal insufficiency has an inhibiting action on gastric secretion. Suprarenal insufficiency provides conditions favorable for the development of gastric ulcer. He has observed gastric ulcer only in cases with symptoms of extreme suprarenal insufficiency, but probably comparatively mild insufficiency might reënforce other factors in the pathogenesis of gastric ulcer. The effect of fatigue and emotions on persons with hyperchlorhydria and gastric ulcer may be explained by the exhaustion of the suprarenals. This explains the benefit realized since the suprarenals recuperate on resting.

Claude, H., and Bernard, S. CONDITIONS OF THE ENDOCRINE FUNCTIONS. [*Bulletins et mémoires de la Société médicale des hôpitaux* de Paris, December 25, 1919.]

These authors found that among acromegalic patients injections of pituitary extract are without effect, even with large doses. In typical cases of exophthalmic goitre, subcutaneous injection of posterior pituitary lobe extract distinctly lowers the heart rate for a time and markedly reduces the systolic blood pressure, whereas in normal individuals or persons with tachycardia independent of thyroid disturbance, reduction of systolic pressure is but slight and the pulse rate is not lowered. In subjects with thyroid insufficiency or myxedema, subcutaneous injection of pituitary extract causes pulse acceleration and the blood pressure is reduced. If such subjects, however, be made hyperthyroid by thyroid medication, they then react like cases of exophthalmic goitre, viz., with a reduced pulse rate and general manifestations more pronounced than before thyroid preparations had been injected. Similar results occur after injection of adrenalin. In subjects rendered hyperthyroid artificially, as well as in cases of exophthalmic goitre, pulse acceleration and general reaction are much more marked than in normal individuals. Thus the nature of the cardiovascular reactions, following injection of

certain ductless gland products varies according to the functional condition of certain of these glands existing at the time. These reactions, which show qualitative differences according to endocrine conditions in the individual, may be studied for diagnostic purposes.

II. SENSORI-MOTOR NEUROLOGY

1. PERIPHERAL NERVES.

Southard, E. E., and H. C. Solomon. MORBI NEURALES. An attempt to Apply a Key Principle to the Differentiation of the Major Groups. [Am. Arch. Neur. and Path., 1919, Vol. II, 1919.]

The method of diagnosis by orderly exclusion, already proposed for use in the diagnosis of mental diseases, is probably of equal value in the field of nervous disease. The writers have endeavored to gather the main types of the latter into comparatively small groups for successive consideration by the tyro, or even by the expert, in diagnostic elimination. Experts may prefer a different order from the one proposed; but it is unlikely that any neurologist fails to use, consciously or unconsciously, some form of orderly diagnosis.

Yet the student is quite likely to be taught that the best procedure is to pick out some striking symptom in a case under consideration, and to follow that symptom back to textbook models for a suggestion as to the entity involved. He then endeavors to match the data with the possibilities laid down in the textbook.

We think that it is much more desirable to take the general situation in the body at large into account, and to include, if possible, the hypothesis of an infectious origin for the symptoms. Next, to exclude, if possible, the effects of coarse and otherwise destructive lesions of the nervous system (historrhexes), *i.e.*, such conditions as show no signs of infection, but exhibit reflex disorders and signs of heightened intracranial pressure, etc., suggestive of focal lesion. Then, to consider the hypothesis of the existence of one or other of those classic degenerations with which the neurologist is familiar. If infection, historrhexis, and classic degenerations can be excluded, the hypothesis of some kind of imbalance, perhaps metabolic or endocrine or sympathetic should be studied. If the diagnosis cannot be made on these lines, possibly the condition belongs to some miscellaneous and otherwise undefined or highly specialized group.

Even when the disease seems to be limited to a peripheral nerve, then the successive hypotheses of (1) infection, (2) historrhexis, (3) specialized neuronatrophy, (4) imbalance, can be preferably considered in that order. By the pursuit of some such method as this the neurologist can bring his work better into line with that of general medicine. The method is, moreover, a very pragmatic one, since lines of treatment are specially indicated for the different great groups of disorders. But in so difficult a field we do not wish to dogmatize, and shall be content if

our communication arouses interest in the application of the key or order principle to the diagnosis of nervous diseases. [Author's abstract.]

Adamkiewicz. CONCERNING THE PERICELLULAR GOLGI'S NETWORK IN THE CENTRAL NERVOUS SYSTEM. [*Zeitschr. f. d. ges. Neur. u. Psych.*, Sept. 20, 1919, No. 4-5, Vol. 51.]

The most interesting point for histological research in the central nervous system has long been concerning the connection existing between the various nerve elements (nerve fibers and cells). By means of the molybdenum staining method proposed by Berthe the author was able to bring out the pericellular network of Golgi and the intercellular net formations in a most distinct manner. In the same section the Golgi network and the minute fibers could be traced very clearly, which is not usually possible, as most stains are imperfect in this respect. Transitions of the axis cylinder endings to the network of Golgi could not be discerned and there seemed to be no connection between the fibrils and the network. There was, on the other hand, a very close connection between the pericellular network of Golgi and the intercellular network, that is the interstitial network of Berthe. The mesnes of both these formations fade into each other. The intercellular network, in turn, is closely connected with the glia cells, the vessels, and the medullary sheaths of the nerve fibers, forming about them constriction rings which, to a certain extent, resemble the Golgi network. Judging from its manifold relations to other formations, especially to the medullary fibers and glia cells and, further, from the fact that everywhere throughout the entire nervous system it fills out the lacunæ between the separate cells, the author believes that the intercellular network is to be regarded as belonging to the supporting tissue, *i.e.*, to the glia. As the Golgi network is continued without perceptible interruption in the glia reticulum (as Held called the intercellular network), the Golgi network must be regarded as a specially modified form of the glia network.

Mendel, Kurt. ACUTE FEBRILE POLYNEURITIS. Mononeuritis Multiplex Infectiosa. [*Neurol. Centralbl.*, April 16, 1918, No. 8, Vol. 57.]

Holmes and Singer have described cases of this disease to which the author adds one of his own. It was that of a young and healthy soldier who had never had anything to do with poisons. Suddenly in the field he was seized with the following symptoms accompanied by fever: headache, diplopia, pain and weakness resembling paralysis in the legs, arms, and shoulder. Five weeks later the patient manifested weakness of the left facialis, weakness, atrophy, and hypotony of the left arm and shoulder region with the loss of triceps and weakness of infraspinatus reflex, and a very extraordinary condition of the biceps deltoidus and trapezius in the form of a peculiar reaction to electrical stimulus. Besides, there was pain to pressure in the nerve stems of the left arm and leg. The

tactile sense was entirely normal. Thus there was, in the author's case, as in Singer's an arbitrary selection of muscles by the disease, which corresponds to none of the usual types and justifies the name *mononeuritis multiplex*. As in Holmes' and Singer's cases, the etiological factor of this neuritis must have been an infection, but the nature of the infection could not be determined. As the disease began with fever and general cerebral disturbances, it was evidently the brain nerves that were first affected; afterwards the neuritis became centered in the left shoulder and arm region. The only disease suggested in the differential diagnosis was *poliomyelitis anterior*, but evidence against this disease was the fact that *poliomyelitis* in adults is of rare occurrence and that there were no other cases in the environment. Besides in Holmes' case, which resembled the author's, the autopsy revealed peripheral neuritis, and in the anterior cornu only those slight changes which are usually found in peripheral neuritis. In all probability, there were, besides the inflammatory disease in the peripheral nerves, which was the most pronounced feature of the case, also some changes in the anterior cornua and these might have been of either primary or secondary character. In reference to these various findings, Remak, in his treatise on neuritis, states that in certain cases even the post-mortem may leave doubt as to the pathogenesis of the disease, and, the author adds that the clinical diagnosis of such cases is likely to vary according to the individual opinion of the diagnostician. Another disease having resemblance to the author's case is Landry's paralysis in which both peripheral neuritic and *poliomyelitis* changes have been observed.

Wexberg, Erwin. DISEASES OF THE PERIPHERAL NERVES IN THE WAR. [*Zeitschr. f. d. ges. Neur. u. Psych.*, July 11, 1919, Vol. 49, p. 14.]

The author had opportunity, in military hospitals during the war, to observe a larger number of cases of neuritis and polyneuritis than would ever have been possible in civil life. Such experiences enrich the knowledge of non-traumatic diseases of the peripheral nerves principally in the direction of the etiology. The great frequency of polyneuritis of ideopathic type was particularly striking. Polyneuritis as result of cold was characterized by two peculiarities—acute onset and absence of ataxic and paretic symptoms. Ataxic forms of polyneuritis seemed to be the result mostly of infectious and toxic causes, among which, in the material coming from the war, alcohol plays a very insignificant etiological rôle. Among the cases of polyneuritis of toxic character were two cases of lead poisoning of unknown origin. This fact gave rise to the suspicion that in many other cases which seemed to be ideopathic, there might have been a specific toxic etiology, even where there was no evidence of intoxication in the anamnesis. The characteristics by which toxic polyneuritis may be recognized, especially that due to lead or arsenic poison, are the subacute development and the insidious course.

The author calls attention to the great frequency among post infectious types of post-typhus paralysis as well as to the paralysis in combined localizations also characteristic of typhus, *i.e.*, to the cases of spino-peripheral and cerebrospino-peripheral affections. Neuritis and polyneuritis were met with after pneumonia, dysentery, typhus, sepsis, gonorrhea, though sequelæ of this type are rare after these diseases. There were two cases of ulnaris neuritis after paratyphus A, which must be understood as a toxico-traumatic paralysis, that is, as paralysis produced by pressure on a special nerve where the nervous system had been predisposed to injury through the action of the bacterial virus. The author is of the opinion that the so-called purely sensible neuritis is scarcely to be diagnosed as a true type of neuritic affection; it is very doubtful if neurasthenia is a cause of polyneuritis, and exhaustion polyneuritis and war neuritis can scarcely be regarded as diseases of the peripheral nerves.

Woods, Andrew H. MISLEADING MOTOR SYMPTOMS IN THE DIAGNOSIS OF NERVE WOUNDS. [Am. Archives of Neurology and Psychiatry, Nov., 1919.]

In the traumatic affections of mixed nerves their motor fibers are more vulnerable than their sensory fibers. Hence voluntary movements become a delicate index of the condition of a nerve.

But erroneous conclusions were at times reached because of abnormal innervation. For instance muscles of the hand or forearm ordinarily innervated by the median nerve were found in certain individuals to be served through the ulnar.

But a commoner error was due to substitute movements which some patients acquired after the muscles ordinarily responsible for a particular function had been paralyzed. Examples mentioned were: Movements brought about by the elastic rebound of a joint. Attempt to contract a paralyzed muscle often results in an involuntary contraction of its antagonists. This is followed by a rebound due to the resiliency of the soft tissues. Movements due to the very rigidity of a paralyzed muscle which, however, resemble these normally produced by that muscle before it was injured. For instance, patients with inert musculo-spiral extensors of the digits and wrists draw their wrists into the extended position by flexing the digits. Contrary to the opinion of some careful observers, the extensor longus digitorum aids in extending the middle and terminal phalanges; and when the ulnar nerve is paralyzed these extensors alone are responsible for the movement. The lateral movements of the digits also were in some patients replaced by specious substitutes. Reference was made to pronation effected through the musculospiral forearm muscles, and to supination through the biceps even when the elbow is fully extended. Procedures for the detection and elimination of these "trick movements" were suggested by the writer. [Author's abstract.]

2. SPINAL CORD.

Gordon, A. H. INTERNAL HYDROCEPHALUS AND XANTHOCHROMIA OF THE SPINAL FLUID. [Canadian Medical Association Journal, November, 1919.]

The author reports a case with the findings both antemortem and postmortem and discusses them. The following summary of definitions and points of discussion is of interest:

The syndrome of Froin consists of a spinal fluid of yellow color (xanthochromia), which coagulates *en masse* and shows an abundant lymphocytosis. The syndrome of Nonne consists of a spinal fluid showing a marked increase of globulin without an increase of cellular elements. These features may be complete or partial and variations may exist in the several factors. The syndrome of Froin, or xanthochromia alone, usually indicates an isolation of one portion of the subarachnoid space from the rest, by tumor, adhesions, etc. This separation is usually found at the lower levels of the cord. Internal hydrocephalus may be associated with separation of the spinal from the cerebral subarachnoid space either by adhesions of the brain stem to the tentorium, or by hernia of the distended brain into the foramen magnum. In the case here reported the possible explanation is, (1) basal meningitis; (2) partial recovery; (3) obstruction of foramina in the roof of the fourth ventricle by meningitis; (4) development of a noncommunicating hydrocephalus; (5) hernia of the brain into the foramen magnum; (6) separation and sacculation of the spinal subarachnoid space, development of partial Froin's syndrome. A possible explanation of Froin's syndrome lies in the separation of the sacculated portion of the subarachnoid space from the choroid plexus through which normally it is filtered, and a reversion of its contents to a simple lymphoid material—yellowish, coagulating, and cellular.

Becht, F. C. STUDIES ON THE CEREBROSPINAL FLUID. [Am. J. of Phys., 1920, LI, p. 1.]

The point and mechanism of origin of the cerebrospinal fluid is not clearly settled because obvious objections to the proofs offered that the fluid originates from the choroid plexus by a secretory process can be pointed out. The direct evidence that the fluid comes from the choroid plexus by a secretory process is anatomical, but a comparison of the description of the changes in the choroid plexus, after the action of secretory drugs, with the changes in the parotid gland of the rabbit under similar conditions, leads to obvious discrepancies, for the changes in the two structures are exactly opposite in character, yet both are considered evidences of the same physiological activity, secretion. The fact that plugging the aqueduct of Sylvius is followed by internal hydrocephalus does not prove that the fluid comes from the choroid, for in the region under observation, fluid formation might result from

activity of the choroid plexus, from stimulation of the ependyma cells lining the ventricle, from transudation from the capillaries, or from the formation of intracranial lymph. Further, the rate of formation may be entirely normal, the whole pathology being merely decreased absorption of fluid.

Evidence is offered proving the superiority of the manometric method over the secretory method of study. The former was employed in most of this work: the latter being used only as a control, and as a means of comparing the results of the work with the results already in the literature. It will be noted throughout the work that there are numerous variations in the level of venous pressure in the skull independent of the arterial pressure and a remarkable parallelism between the venous and fluid pressures. This fact makes it clear that in experiments on the formation of the cerebrospinal fluid the venous pressure must always be measured.

The normal levels of arterial, venous, and fluid pressures were found to be exceedingly variable, the average of the first readings from 39 dogs were: arterial 127.79 mm. of Hg., venous 124.97 mm. Na_2CO_3 (sp. gr. 1.088), and fluid 112.25 mm. NaCl (sp. gr. 1.088). The observation of the variation in pressure in long time experiments showed that the arterial pressure might vary in the same or opposite direction with venous and fluid pressures, but no matter whether arterial pressure varied with or against venous pressure, the venous and the fluid pressure varied in the same direction and proportionally. Since it was further shown that a rise in venous pressure produced a rise in fluid pressure, but a rise in fluid pressure *did not* produce a rise in venous pressure, the measurement of the venous pressure is absolutely necessary to rule out mechanical changes in fluid pressure due to changes in the venous pressure. Increasing the arterial and venous pressure in the skull increased fluid pressure. Decreasing the arterial and venous pressure in the skull decreased the fluid pressure. Increasing arterial pressure with the venous pressure held a constant increased the fluid pressure. Stimulation of the peripheral end of the cut vagus sometimes increased, sometimes decreased the fluid pressure, and the change is adequately explained by the change in venous pressure. Stimulation of the central end of the sciatic sometimes increased, sometimes decreased the fluid pressure. The change is satisfactorily explained by the change of venous pressure. The outflow method also was employed in the study of the effect of respiration. Increasing the respiration by stimulation of the central end of the Sciatic increased the outflow in 10 cases, decreased the outflow in 2 cases, and produced no change in 5 cases. Hence the effect of respiration is not the same in all cases of increased respiration. The increased outflow was explained as the outflow of preformed fluid released from distant parts of the sub-arachnoid spaces by the increased movements of the nervous system,

the decreased outflow by the flow of fluid from the region of the third ventricle to distant portions of the subarachnoid space for the same reason. Stopping the respiration by stimulation of the central vagus and the superior laryngeal and asphyxia produced by opening the thorax produced changes in the fluid pressure, which are adequately accounted for by the changes in the arterial and especially in the venous pressures.

Because of lack of a satisfactory method the normal rate of formation and absorption of the fluid could not be determined. Atropine and pilocarpine were shown to be absorbed from the dural canal fairly rapidly, but produced their effects more slowly than after intravenous injection, but at approximately the same rate as from other free surfaces of the body. Adrenalin and nicotine were absorbed too slowly to produce their characteristic pressor effects on the blood pressure. Adrenalin was demonstrated to be present in the dural canal for five hours after its intradural injection, hence the absorption of this drug must be relatively slow. It was shown that a fixed amount of adrenalin diluted with large amounts of fluid was protected, while the same amount diluted with a small amount of fluid was destroyed. This is exactly the reverse of the changes known to occur when adrenalin is diluted with 0.9 per cent. NaCl. This "protective action" is lost if the fluid is heated to 65-70° C. for 30 minutes.

Secretin was shown to leave the dural canal too slowly to produce secretion from the pancreas. Pilocarpine in small doses was shown to produce an increase in venous and fluid pressure with a rapid return to the normal, the change in the venous pressure being adequate to explain the change in fluid pressure. The curves were the same whether the jugulars were ligated or not, therefore the question of re-absorption of newly formed fluid was eliminated. Large doses of the drug produced falls in arterial, venous, and fluid pressures, an observation which explains the well-known fact that large doses of pilocarpine frequently produce a decreased instead of an increased outflow of fluid. The effect of adrenalin, arecoline, atropine, and amylnitrite was shown to be due to vascular changes. All the changes observed in fluid pressure and fluid outflow which have been offered as physiological proof of the secretory origin of the cerebrospinal fluid can be traced to alterations in the venous and arterial pressure in the skull. [Author's abstract.]

Becht, F. C., and Matill, P. M. STUDIES ON THE CEREBROSPINAL FLUID.

VI. A STUDY OF TISSUE EXTRACT. [Am. Jl. Phys., 1920, LI, p. 126.]

To simplify the study, the tissue extracts were divided into groups: (1) Those having a depressor effect on the blood pressure. (2) Those having a pressure effect on the blood pressure. (3) Those said to have a specific effect on the formation of fluid either stimulating or inhibiting the rate of formation.

Depressor Extracts.—Into this list falls extracts of spleen, pancreas, lymph gland, ovary, testicle, submaxillary, parotid, skeletal and heart muscle, kidney, liver, cerebrospinal fluid and aqueous humor. In 90 injections made in this series it was observed that arterial venous, and fluid pressures fell almost simultaneously in all but a very few cases. In most cases the pressures returned almost exactly to the original levels. The most striking phenomenon, however, is the fact that cerebral venous and fluid pressures ran almost absolutely parallel courses. The effect of these extracts upon fluid pressure and fluid outflow is explained on a purely physical basis.

Pressor Extracts.—In this list are included adrenalin and extracts of the whole or posterior lobe of the pituitary body. Commercial preparations were also used. The effects of adrenalin have already been adequately studied. It was shown that no matter whether arterial pressure was increased or decreased the fluid pressure paralleled the venous pressure which sometimes rose, sometimes fell. It was also shown that when the outflow method was employed a marked fall in arterial pressure was frequently accompanied by a rise in the venous pressure, a condition which was accompanied by an increased outflow of fluid from the needle. Thus an increased outflow of fluid occurring in cases where arterial pressure alone was measured could not be considered adequate proof that there had been an increase of the formation of fluid. The conclusion was reached that extracts of the pituitary and pituitrin exert only a mechanical effect upon the fluid.

Extracts Alleged to Have Specific Effect upon Fluid Formation.—Stimulating: brain, choroid plexus. Inhibiting: thyroid.

A study of the effects of extracts of the cerebrum, cerebellum, medulla, and cord showed these tissues to have a profound depressor effect upon the blood pressure quantitatively greater, but qualitatively similar to the effect of the other depressor extracts named. The effects are purely mechanical; there is no evidence of new formation for the fluid changes are due to changes in arterial, but to a far greater extent in the venous pressure. An extended study of extracts of the choroid plexus showed that the effect of this extract upon the fluid is purely mechanical. Further the effect of this extract is not limited to the structure generating the fluid, since it is apparently as efficient a lymphagogue as a 2 per cent. solution of peptone. Thyroid extract, exactly like any other depressor extract, produces only mechanical changes and thus exerts no specific effect upon the fluid. [Author's abstract.]

3. CRANIAL NERVES AND MEDULLA.

Hecht, Selig. PHOTOCHEMICAL NATURE OF THE PHOTOSENSORY PROCESS. [Jour. of Gen. Physiology, Vol. II, pp. 229-246, 1920.]

The response of certain animals to light is preceded by a quiescent period of several seconds. This interval of time, however, is not simple,

but is composed of two separate portions. The first is a period during which the animal must be exposed to light; the second is a true latent period during which the animal may remain in the dark, and at the end of which the response takes place. Investigation shows that the relation between the intensity of the light and the duration of the initial exposure period obeys the photochemical reciprocity law of Bunsen and Roscoe, the minimum energy required for a response being 5.62 meter-candle-seconds. This minimum varies very little with temperature; the temperature coefficient for 10° C. is 1.06. The constant energy requirement and the small temperature effect are highly characteristic of photochemical processes. It is therefore concluded that the initial effect in the process of photoreception is the decomposition of a photosensitive substance by the light.

The animals investigated are preëminently the kind that are sensitive to sudden illumination as opposed to those sensitive to prolonged illumination. It has been generally supposed that whereas for the latter group the stimulus consists in a definite quantity of light, for the former it is the *rate of change of intensity* which is the stimulus. The present results show that this traditional distinction is erroneous, because the stimulus for both groups of organisms is a definite amount of light energy concerned in a photochemical reaction. [Author's abstract.]

Meyer, W. LOSS OF PUPILLARY REFLEXES NOT CONDITIONED BY LUES.
[Neurol. Centralbl., April 16, 1918, No. 8, Vol. 37.]

Bumke, in the second edition of his work on disturbances of the pupil, sums up his experience in several thousand cases by stating that he had never observed true loss of pupillary reflexes except where there was tabes, paralysis, or brain or constitutional syphilis. Nonne has communicated two case histories which support the view that pupillary disturbances of this nature may arise in alcoholics, and Biermann and Westphal have published cases seeming to prove conclusively that loss of pupillary reflexes may be due to a general diseased condition resulting from diabetes. The author, upon the suggestion of Nissl, presented a case examined at the Heidelberg Psychiatric Clinic, in which the Argyll-Robertson phenomenon was present without any sign of lues, tabes, or paralysis. A laborer fifty-one years old, twenty-three years ago had fallen from a ladder and as a result of brain concussion lay for some days unconscious. He was judged to be two thirds disabled and received compensation to that extent, the diagnosis being typical traumatic neurosis. When he came to the Heidelberg clinic for examination he presented the typical picture of this disorder. Upon examination the eyes showed no direct signs of injury. The pupils were contracted and unequal, the diameter of the right being 2.0 mm. and the left 1.5 mm.; absence of reflexes to light, very perceptible reflex in convergence. When homatropine and cocaine were dropped into the eyes there was

only imperfect dilation; opacity of lens on both sides: lamellar cataract could not be determined because of the contraction of the pupils; fundus oculi was normal on both sides; acuteness of vision not greatly diminished so that any considerable disturbance owing to deep-lying disease in the opticus could not be assumed. Wassermann in blood and spinal fluid were negative. No certain case of bilateral loss of pupillary reflexes due to trauma is known. The case seems to be an inexplicable rarity unless a bilateral benumbing of the reflexes be assumed, due to a neuritis of the opticus of unknown etiology, and this, from the manner in which the pupillary disturbance developed, seems improbable.

Krueger, Hermann. UNILATERAL LOSS OF PUPILLARY REFLEXES. [*Neurol. Centralbl.*, April 16, 1918, No. 8, Vol. 37.]

In contrast with the bilateral loss of pupillary reflexes, frequently encountered and, almost without exception, the expression of syphilitic disease of the central nervous system, unilateral loss of pupillary reflex to light is relatively rare, and when met with, in tabes, paralysis or brain syphilis, is usually only a transient phenomenon. Still more rare are observations of permanent unilateral rigidity to light accompanied by no other symptoms than disturbance of the oculomotorius, or as the sole symptom of neuropathic disease, though Bumke states there is no longer any doubt that disturbances in the centrifugal branch of the pupillary reflex arc may, in exceptional cases, produce unilateral rigidity to light. All cases of this nature, however, which have hitherto been published have been of traumatic peripheral genesis connected with disease processes of other sorts in the innervation region of the oculomotorius, in many instances being the residue of a cured or greatly improved extensive paralysis of the third brain nerve. Thus, in an observation of Axenfeld's, there was after a head trauma, a contraction of the right pupil, and only very slight direct or consensual reaction to light with good convergence reaction; a paralysis of the rectus oculi superior pointed to a peripheral localization of the disturbance. Abelsdorff, as explanation, referred to the fact that where muscles have once been paralyzed those which act synergically are likely to react more readily to stimuli than others, and for this reason the muscles would more easily respond in convergence, being in physiological association with the muscles of the unaffected eye, while the reflex to light might fail to be elicited. The author gives three observations of unilateral loss of pupillary reflexes with essentially normal reaction in convergence. In one it was possible to assume the disturbance due to a disease localized in the region of the oculomotorius nucleus, or of the sensory trigeminal nucleus or its roots, but in the other two the localization of the disease process was obscure. In these there was rigidity of the pupil on the right side with some mydriasis and with only negligible reduction of reaction in convergence. In both cases and all nervous disturbances that

result therefrom could be excluded. From the fact that in the affected eye the direct and consensual light reflexes were absent and in the other eye were prompt and adequate, disease of the centripetal sensory branch of the reflex arc must be excluded, and it must be assumed that there is a lesion of the centrifugal motor branch, *i.e.*, of the oculomotorius, of the ciliary ganglion or of the ciliary nerve; or disease of the sphincter nucleus, or destruction of the conductivity of the terminals of the centripetal reflex fibers in the neighborhood of the sphincter nucleus. There was nothing in these two cases to indicate a disease of the oculomotor nerve or of its intraorbital terminations due to trauma of the orbit or of the separate motor fibers innervating the external eye muscles. There remains as a probable localization of the disturbance only the nucleus region of the sphincter pupillæ itself or of the region immediately surrounding it; for the author thinks he is justified in rejecting the unproved theory that pupillary rigidity may result from lesions of the cervical cord or of the medulla oblongata. Disturbances in the musculus sphincter pupillæ and in the ciliary nerve terminations innervating this muscle, must also be excluded because of the prompt effect produced by pilocarpine dropped into the eye. The author refers to theories which might be adduced to account for the unilateral loss of reflex to light with intact reflex in convergence. According to experiences in other diseases, especially in polioencephalitis hemorrhagica the conclusion has been reached (Wernicke) that the central gray matter is a substratum with slight resistance to disease and that the innervation centers of the sphincter pupillæ itself is especially lacking in resistance, may be assumed. According to this supposition the region on which the convergence depends might have greater resistance than the paths controlling the reflexes to light. Another theory is the Abelsdorff hypothesis of more ready response of the reflexes in synergic action. The author, however, thinks it more probable that the phenomenon is due to different localizations of the paths of the reflexes, the disease process being situated where the reflex arc of the light reaction is still separate from the paths controlling the convergence reflex, probably in the terminals of the centripetal reflex fibers around the sphincter nucleus—the localization Bumke assumes for isolated rigidity of pupils to light. The author's three cases show that unilateral rigidity to light may occur in individuals without luetic infections, localized in the centrifugal branch of the reflex arc, being independent of peripheral disturbances of the oculomotorius or its terminations, and, therefore, centrally conditioned. It is probably a disease process localized in the immediate vicinity of the sphincter nucleus, which prevents the conduction of the sensory stimulus to this nucleus. These cases furnish an interesting contribution to the localization theory of pupillary reflexes and especially to the study of the Argyll-Robertson phenomenon.

Nonne, M. ISOLATED PUPILLARY RIGIDITY TO LIGHT IN A HEALTHY ADULT, AS EXPRESSION OF LUES CONGENITA. [*Neurol, Centralbl.*, January 2, 1919, No. 1, Vol. 27.]

It is known that in persons infected by syphilis, anomalies of the pupillary functions may be the only symptoms of the nervous system manifest—anomalies in the form of inequality of the pupils, diminution of the reflexes to the extent of complete rigidity to light, in accommodation and in convergence. Experience has taught that true loss of reflexes to light is the precursor of tabes or paralysis, or, exceptionally, is premonitory of lues cerebri, or that it may be the residuary symptom or lues cerebri or lues cerebrospinalis; and the author adds that this symptom may also be observed in congenital lues, usually associated with psychic or other symptoms. He describes an interesting case of his in which the loss of reflex to light was the only symptom in congenital lues. It is that of a young man who, although of slight neurasthenic tendency, was physically and mentally sound and had endured the hardships of the war for four years, only at the end of that time showing nervous symptoms of exhaustion that yielded to rest therapy. Upon examination the only anomaly found in the nervous system was the rigidity of the pupillary reflexes to light. There were no other signs of congenital lues, the eyes also being free from any further stigmata. The anamnesis showed the patient had never acquired lues; the blood Wassermann was negative. It was found, however, that the father of the patient in his youth, during military service had been infected with syphilis and had died later of paralysis. Loss of pupillary reflexes from other causes than lues have been observed, in rare cases of chronic alcoholism, syringomyelitis, multiple sclerosis, and diabetes mellitus, but all of these diseases could be definitely excluded in the author's case, and the syphilis inherited from the father seemed the only plausible explanation of the phenomenon. There were no other signs of congenital lues. It could not be determined whether the disease processes causing the loss of reflexes had been stationary from the beginning or had at some period lost the tendency to progression. It would be of great interest to examine a case of this sort microscopically, with all the appliances of present-day science, to determine the condition of the regions upon which the anomaly depends, and especially to determine if the spirocheta pallida was present. In the author's case the Wassermann was negative and the presence of the spirocheta would hardly seem probable.

IV. FORENSIC NEUROLOGY

Blair, T. S. DRUG ADDICTION. [*Journal A. M. A.*, May 17, 1919.]

Blair reports on the measures taken in the state of Pennsylvania for the enforcement of the Harrison Law, which by act of legislature has been incorporated in the state statutes. Special provisos, however, make it unlawful to supply the named drugs in any quantity whatever to

known habitual users except in following the prescription of a duly licensed physician or dentist. Physicians may, under proper regulations, and after a physical examination of an addict, take such a person under treatment in good faith for the purpose of curing the habit and not satisfying a mere craving. A dentist, however, cannot undertake the treatment of an addict. The records must be kept except in emergency cases, and licenses of physicians and others may be suspended or revoked on conviction of violation of the act or of being an addict. Veterinarians may not treat human beings with the drugs, but may give them to an animal under their care. The bureau of drug control has been created, and, "by means of monthly reports covering all purchases of narcotics by physicians and other professional persons, statements from all registered retail druggists of every prescription carrying material quantities of narcotic drugs and giving the names of patients and physicians, registration of addicts, inspections, police investigations, detective work, and a clinical study of addicts themselves—all followed up intensively in a 'This Means You' campaign—is accumulating dependable data which justify some comment." From the pharmacologic point of view, Blair says physicians commonly fail to differentiate between narcotism and narcosis. The former is simply stupor due to narcotics, while narcosis is the syndrome following their continued use. Many physicians who have chronic or painful conditions to meet do not seem to realize the danger of addiction, and are sometimes the cause of narcosis in their practice. Any sporadic or half-way measures of repression of drug addiction fail, as the commercial instinct offsets the good done, and the illicit professional use of drugs becomes more aggravated. Just as much attention must be given to small places as to the large cities, and while the largest proportion of illicit and private indulgence is found in the vicious districts of large cities, the largest proportionate indulgence in drugs is found in the smaller places, although the vicious population is smaller. Taking the state at large, Blair thinks the prescriptions of doctors are the main supply of drug addicts. There is always a plausible excuse and the records show that such addicts visit several physicians. The addicts lie and exploit the physicians most shamelessly, and forged prescriptions are common. Some forgers steal pads of prescription blanks from physicians and druggists, and sometimes even the drugs. A woman was recently arrested for forging twenty-six prescriptions and five physicians were also writing prescriptions for her. Prescriptions are often written so illegibly that a forgery cannot be recognized. Some physicians order their drugs from supply houses that shade their prices and sell short weight. The possibilities here are immense. Thousands of prescriptions for paregoric, exempted by the Harrison Law, are given for adults, though the preparation is ordinarily for children. Many druggists sell it freely, though they realize that the buyer wants both alcohol and opium as an addict. The National Formulary elixirs of terpin hydrate and codein, and terpin hydrate and heroin, and a host of

similar proprietary remedies, are the best sellers. Codein is the narcotic most frequently appearing in the records, and morphin next, and then preparations of opium, followed by heroin and others. Codein is, however, rarely prescribed in excessive dosage, though heroin is, especially in Philadelphia. Proprietarys, not federally exempt, are largely prescribed. Chief among these is glycoheroin. A number of interesting details as regards prescriptions and purchases of narcotics are given, and Blair thinks the manufacture of heroin should be absolutely suppressed. On the face of the reports, pure addition is rare, all addicts claiming some disease, but it is believed to exist in the majority of cases. As regards the treatment of drug addiction the gradual method is said to be usually a failure. The real measure needed is detoxication. Blair is convinced that the sale of all habit-producing drugs should be made a government monopoly under the control of one official, to whom every part of the government supply for the district should be sent, and who could estimate the actual needs and see that they are met, but nothing further. He should have a report of every addict in the district, as well as of all persons requiring drugs in excess of the usual amount. Blair believes that this would be the most successful means of meeting the situation.

Juarros, C. MORPHINE ADDICTION. [Siglo Med., March 22, 1919.]

Morphinomania is every day becoming more and more frequent in Spain according to Juarros. He does not approve of sudden withdrawal, but prepares the patient for it with a course of alkalines to combat the hyperacidity. He gives Vichy water to drink or by injection, and sodium bicarbonate.

Iglesias. HASHISH IN BRAZIL. [Annales Paulistas de Med. et Chir., Dec., 1918. J. A. M. A.]

Iglesias states that *Cannabis sativa* is cultivated in certain regions in the north of Brazil where it is smoked in a special pipe, the smoke passing through water, or in the form of a cigar. He has been experimenting with laboratory animals placed in conditions like those of these human inhalers of the cannabis smoke. The animals showed signs of toxic action, vomiting, paralysis and torpor, but they were transient; the animals had quite recuperated by the end of two hours. Injection by the vein of some of the water through which the smoke had been passed caused no toxic symptoms in the animals. Iglesias describes some special instances of the cannabis smoking vice to illustrate the apparent inevitable mental derangement which its frequent use entails, the hallucinations liable to lead to crime or suicide. The cannabis smokers often form clubs for smoking in common at first, but when they become addicted to the vice they prefer solitude, and gradually fall into the aspect and manners of demented. The drug is called mostly diamba in Brazil, hashish in the Orient. Iglesias urges prompt government measures to check this vice.

DRUG ADDICTION IN THE UNITED STATES. [New York Medical Journal.]

The special narcotic committee appointed by former Secretary of the Treasury McAdoo to investigate the drug traffic in this country has presented a report which shows the United States as the largest consumer of drugs in the world, with 1,000,000 addicts and more than \$61,000,000 spent annually by drug users. The committee's table for the per capita consumption of opium in the United States and foreign countries is as follows:

Country	Population	Total annual consumption pounds	Consumption per capita grains
United States	100,000,000	470,000	33
Holland	6,000,000	3,000	3.5
France	40,000,000	17,000	3
Portugal	5,500,000	2,000	2.5
Germany	60,000,000	17,000	2
Italy	33,000,000	6,000	1.25
Austria	46,000,000	3,000-4,000	1.5- .6

Native born Americans lead in the consumption of the drug, according to this report, and the majority of immigrants listed as addicts did not reach their unfortunate state until they had been in the United States some time. Ninety per cent. of the drugs consumed in this country are used for other than medicinal purposes. Moreover, the traffic is increasing by leaps and bounds. Practically all of the larger cities, among them New York, report increases, and one estimate of the nation's number of addicts included in the report is 4,000,000. Of the committee's figure of 1,000,000 drug users, 250,000 are unemployed. An underground "dope trust" of peddlers who carry on a traffic in smuggled drugs estimated to be equal in magnitude to that carried on through legitimate channels is also shown in the report. Police officials reported 1,800 "dope" peddlers and listed their occupations as gamblers, taxicab drivers, domestics, solicitors, messengers, pool-room employees, porters, etc.

The first questionnaire sent out by the committee was addressed to all physicians registered under the Harrison Anti-narcotic Act. The replies show the following number of addicts receiving medical attention and the number of narcotic prescriptions dispensed during the past year in various states:

State	Number of addicts	Narcotic prescriptions filled
California	3,338	270,334
Connecticut	11,740	207,455
Illinois	8,218	1,679,711
Indiana	8,438	250,837
Iowa	2,496	153,721
Massachusetts	14,770	492,246
Michigan	5,757	373,688
New Jersey	5,900	565,584
New York	37,095	2,673,292
Pennsylvania	10,202	2,365,007

The Commissioner of Health of the city of New York reported 103,000 addicts. The committee in its conclusions and recommendations asked for the rigid enforcement of the antinarcotic laws, stringent State and municipal legislation, and the enactment of federal legislation to provide treatment for addicts so they can be cured. The State Department is asked to take immediate steps to prevent the traffic that comes into this country from Mexico and Canada.

Cushing, H. THE NEUROLOGICAL ASPECTS OF RECONSTRUCTION. [Cong. Am. Phys. S., June 16, 1919, Med. Rec.]

Cushing stated that he could best bring out the point he wished to make by citing a concrete instance. A short time ago he received a visit in his office from two discharged soldiers. The first of these, whom he would designate as Private "L," was the victim of an air raid and had undergone amputation of both legs at the thighs. He had been fitted with artificial limbs, had finally received his discharge after having been graded in the 100 per cent. disability class, and would undoubtedly receive his pension of \$57.00 a month. He was a student at the Institute of Technology and had a bright future. The second man, whom he would call "A," received a head wound with loss of consciousness. He was operated on at a field hospital twelve hours later by the chief officer of one of the neurological teams. A detailed record of his case was kept illustrating how carefully observations were made by the neurosurgical teams. These records gave a complete description of his cranial and other wounds and the neurological findings. He was recorded as having aphasia, agraphia, and homonymous hemianopsia. He was removed from one place to another until he finally reached Brest, and was later sent to New York. He was then sent to a base hospital from which he was discharged on December 7 with orders to report for duty. He was found wandering about the streets of his home town without any idea of where he was. He was taken to a local army hospital where he remained four months, during which time efforts were made to re-educate him. He had formerly been a bookkeeper and accountant and was assigned to a class to learn arithmetic, but he became confused and unable to grasp the instruction. He was finally discharged and a disability of 90 per cent. granted him with a pension of \$27.00 a month. He was about the type of an early Jacksonian epileptic, there being a definite slowing of all his mental processes. The status of both of these individuals was open to revision. The soldier who had been subjected to operative treatment received the reward due to a soldier without legs, while the soldier who, to outward appearances was unharmed, but who suffered a residual defect in his cranial processes and had really suffered the greater disability, did not receive a reward commensurate with his injury. The word "reconstruction," like "conservation," appeared to be in danger of being overworked; we seemed to forget that it meant simply

later treatment. It referred only to what had been attempted by every other hospital. Occupational therapy was continued in many hospitals and the process was the same in each instance. He had some misgivings lest they might meet with the same defects in their results as were met with in the civil hospitals, especially in the more difficult by-paths of medicine as represented by the psychological cases. Psychological patients and wounded soldiers did not like to go to school in a hospital nor to be ordered into the shops, and in order to keep them a well organized system of entertainment was necessary. The profession as a whole knew less in general about the nervous system than about any other part of the body. The psychiatrists, neurologists, and neurosurgeons of the country were a small minority and their voice had not been listened to. Sane minds were in the long run more essential than sound bodies. The importance of the latter was recognized, yet the stress of life fell heaviest on the central nervous system, and in times of war this strain was increased. When it came to the examinations made by the draft boards the mistake was made of centering attention on eyes, ears, and inguinal rings, and of disregarding the condition of the nervous system. As a result there was a startling number of men with psychoneuroses in the early part of the war. These settled in the hospitals and formed a most difficult class to treat. An effort was then made by the draft boards to comb out the neuropathics, but in spite of this many were left who developed neuroses in the camps and later in the field. It was decided in 1918 to place injuries of the nervous system under a Department of Neurosurgery. Excellent neurosurgical schools were established and a survey was made of peripheral as well as central nerve injuries. It was found from figures compiled by the French that 25 per cent. of disabilities represented neurological problems, and that wounds of the head represented 16 per cent. of all wounds. Cranial wounds did not stand transportation well and required daily observation. Dr. Cushing described the method of keeping clinical records and of forwarding such records from one hospital to another with the patients. When the Division of Neurosurgery was established this system was adopted. The registration of the wounded and their evacuation in any army hospital no less than in a civil hospital was important, and the data collected by a well-trained officer might be of value as a basis of study. There were many difficulties, however, and a good follow-up system was impractical. Even where cards were made out and sent with the patient they rarely reached their destination. The surgeon, therefore, got little that was of value in the advancement of surgical knowledge. There was a tremendous number of repairs of nerve injuries. Of these records had been kept as far as possible, but he did not know that they would have more than historical interest, as they would likely not be applicable to future conditions, since the next war would probably be fought in the air, and what was now called a forward would then be called a base

hospital. Colonel Salmon at the ports of debarkation tabulated all the neurospinal cases and at the port of entry there was a medical officer to distribute these cases to the proper hospital for treatment. Some had been sent to Cape May and some to Fort Sheridan, but one could not reduplicate superior ability, and the attempt had been on the whole a failure, in that all the men had not been placed where first-class ability to treat them was available. This work should be done on a state and national scale and through inter-departmental coöperation. In this way many cases of different types could be brought together and the experienced medical officers of the army could give them their undistracted attention. The manner of distribution made it impossible to keep the men as long as they should be kept, and then, too, many medical officers were desirous of withdrawing from the service. So far as these neurological cases were concerned it was not too late to segregate them. Under the War Risk Insurance they could be gathered together and the work could be carried out, at least in so far as the purposes were concerned for which that Bureau was established. The lessons learned from the experience and mistakes of this group during and after the war might well be applied to the treatment of industrial injuries. The people and the nation had been aroused by the experiences of the war and private and governmental agencies would be more ready than before to extend activities of all sorts for the public welfare than before the war. In the meantime the Division in charge of neurological cases was falling far short of its opportunities. The plan of sending a neurological case to a hospital near his home was a mistake. Parents were anxious to take the man home as soon as possible and he then fell into the hands of the family doctor who had neither the training nor the equipment to care for cases of this kind. Thus it would be seen that the man who had sustained a cerebral injury was justified in asking whether his country was according to him as good treatment as it was to the man whose legs had been amputated. Every effort should be made to rehabilitate the soldier who was suffering from a cerebral injury during the first enthusiasm of reconstruction for the time would come when the country would tire of its cripples and these cases would still remain unfit and unable to readjust themselves to their social environment.

Book Reviews

Frank, C. AFASIA E MUTISMO DA EMOZIONE DI GUERRA. Il Manicomio, Nocera Superiore, 1919.

This monograph takes up the speech disturbances resulting from war experiences in a highly interesting and well-systematized manner from several rather novel physiological viewpoints. The influence of Mingazinni's training in organic neurology and neuropathology is seen throughout the author's work. The monograph begins with a definition and a historical introductory chapter. The author divides his subject into dyspnea, aphonia and anarthria which are responsible for the mutism and aphonia of hysterical origin, the dyspnea, dysarthria and dysphonia being responsible for the various types of stammering and stuttering. He gives a very interesting account of the various types of speech defect and labels each according to its prevailing characteristic defect. He defines for instance, elision, embolophrasie, dyslalia, zeta-cism, gammacism, rotacism, etc., he also refers to rhinolalia a condition in which the voice has a nasal pitch and is due to the immobility of the soft palate. He also refers to the various types of whispering aphonias, etc., defining each type. He classes all the functional disturbances of speech into the following groups:

1. Mutism, deafness and deaf mutism.
2. Hysterical pseudo aphasia.
3. Dysarthria (bradiarthria, scanning, monotony, stammering, etc.).
4. Dysphonia and aphonia.

Mutism.—All of the cases which form the basis for the author's work were observed at the military neurological hospital directed by Prof. A. Tamburini at Villa Wurts and in Mingazinni's clinic in the hospital for the insane at Rome. Under the heading of mutism the author reports in detail thirty-nine cases. He lays great stress on the disturbances of the rate, rhythm and coördination which are almost invariably present in the musculature during the phases of the respiratory act. An interesting observation made from a study of his cases shows that the greater degree of complete recovery of speech function was made in those patients possessed of a non-neurotic previous makeup who suffered a real exposure to shell concussion or an actual injury. The most obstinate cases were those of patients who were actually neurotic before the onset of the trouble and who had not an actual injury but almost exclusively an emotional one. His No. 6 for instance, experienced a sudden sense of constriction in the throat and suddenly

lost speech while preparing to say good-bye to his wife and children prior to returning to the front after his leave. This man did not get well for several months. Another case is the author's observation 14, whose family showed neurological taint and who during his childhood had suffered from asthma. Immediately upon mobilization in May, 1915, he became mute and has spent his time in various hospitals during the entire war, his condition being unchanged in December, 1918. All the cases were fairly well observed and are written up in a thoroughly interesting manner.

Deaf Mutism.—There are thirty-seven observations reported in detail under this heading. The cases vary from absolute deafness even to the loudest sounds and stimuli though unexpectedly applied to other cases of unilateral deafness and hypoacusia or simply verbal deafness or amusia. Other hysterical stigmata were unfailingly present. A very interesting case is observation 40 an "ardito" who suddenly recovered his speech on November 14, 1918, when he began shouting "Long live the King" at a celebration in Rome which was held in honor of the Allied victory.

Deafness.—These cases are usually the residual of deaf mutism, the author reporting only one case.

Hysterical Pseudo Aphasia (Deaf Mutism + Alexia + Agraphia).—Of these cases the author reports two, one of which recovered in five months, the other one still showing signs after two years.

Stammering and Stuttering.—There are 15 observations of this condition, one of which came on following an emotional upset and not any war injury.

Aphonia.—There are three cases of this condition.

Cases with a Hystero-organic Association.—Of this type the author reports seven cases; the first was a case of mutism with Basedow's disease. This man was injured in the right ear by a piece of shrapnel. There was a period of unconsciousness upon waking from which the patient could neither speak nor hear. He also noticed a swelling of the right side of the thyroid. There were tremors of the face and hands and the pulse rate was 130. None of the eye signs of exophthalmic goiter were present. The second was a case of deaf mutism with chronic double catarrhal otitis media and the third deaf mutism with an injury to the drum membranes. The fourth case was one of mutism with an organic deafness depending on chronic middle ear disease. The fifth was a case of hysterical mutism with signs of hemiparesis and hemihypesthesia due to injury of the left Rolandic area. This patient did not have a real aphasia and his speech defect recovered under hypnosis, electro- and psychotherapy. The sixth case was one of hysterical mutism and fracture of the base of the skull. In this case it seems to me that it is impossible to remove the doubt that the residual dysarthria present was not due to the functional element but to an in-

jury to the ninth and tenth cranial nerves. It might better have been left out altogether. I feel this way too about the author's seventh case one of deaf mutism with general paresis. Unfortunately the author has made in this case the same mistake which so many others have made in studying apraxia, aphasia and other speech defects in a disease like general paresis where the mental deterioration is so great. One can never get good results in doing an aphasic or apraxic status in a dilapidated paretic. The author's remarks in this case therefore appear to me to be valueless. There is no report of spinal fluid findings in this case.

From these studies it would appear that the most frequent functional speech disturbances are those of mutism and deaf mutism, which represent 75 per cent. of the cases.

Symptomatology.—The author believes that of the single symptoms observed in mutism the respiratory disturbances are the essential portion of the syndrome. The symptoms are divided into constant and inconstant symptoms. The first group refers to the mutism caused by disturbances with both the vowels and consonants. Of these there are three forms.

1. An interference with the normal respiratory automatic functions of the vocal cords by means of disturbance in their abduction.

2. An interference with the normal adduction of the cords which normally come in contact in the median line and of their resistance of the expired air in producing sound.

3. There may occur an abnormal spasm of adduction resisting with great force the escape of expired air causing inarticulate cries, coughing and raucous voice. There may be also a disproportion between the normal rhythm with which the act of breathing occurs mainly as to duration, depth and the uniformity of respiration. The dysarthrias are caused by disturbances in the soft palate, tongue and in the movements of the teeth and jaws.

The author states that even absolutely mute patients are still able to emit reflex cries of pain. These patients may not be able to make any of the movements necessary for the production of sounds or words. During respiration the chest wall may not expand more than one centimeter, the respired air amounting in some cases to less than a quart and a half as against the normal of three and four quarts. Inspiration is hurried, superficial, and expiration is abbreviated as to time with irregular prolongations of the respiratory pause. There is nearly always a marked disproportion between the movements of the diaphragm and the chest. This dyspnea therefore together with aphonia and anarthria are the constant triad of symptoms in hysterical mutism. The author refers to paralysis of the inferior facial and of the tongue and of paralysis of the soft palate and even of the vocal cords as inconstant symptoms. The paralysis of the facial may be

one sided and limited to the inferior branch but the platysma is never involved. The author says that paralysis of the lower facial has never until now been described in hysteria. A real paralysis of deglutition never occurs. The author has observed a unilateral paralysis of the vocal cords even though this is said never to occur. There may be present also disturbances of sensation in the pharynx or in any other part of the body. Nearly all the cases were polysymptomatic but several had only one symptom. Many cases also had dermatographism, sweating, etc., but the author never saw a grand mal emotional attack of hysteria. There may be a mental depression, confusion, dizziness, palpitation, insomnia, blurring of vision, tremor of the eyes, etc.

Dyspnea with dysarthria and aphonia may occur together, or there may be dyspnea with aphonia or dysarthria alone, the last resulting in stammering. The author lays great stress on the fact that these patients waste in an irregular spasmodic manner the air which is necessary to produce normally even one word and often his cases did not have an expiratory period lasting six to eight seconds. He has seen choreiform and ataxic movements in the vocal cords and these are responsible according to the form and shape which the cords take for the whispering, shouting or shrill sounds produced when they attempt to talk. These tonic and clonic spasms in the tongue, soft palate, etc., also produce the various types of dysarthria.

Differential Diagnosis.—The author presents a table giving the differential diagnoses between hysterical mutism and the two types of motor aphasia, which is very much worth while. He lays particular stress on the fact that in motor aphasia the images for word articulation are absent whereas in mutism they are still well preserved. The only difficulty to be encountered would be with subcortical motor aphasia which is differentiated by means of the absence in that condition of agraphia and alexia and the constant presence of aphonia and dyspnea in hysterical mutism. The author agrees with Babinski that there is no real hysterical aphasia because aphonia never occurs in true aphasia. The functional stammering and dysarthrias are differentiated from organic aphasias by the presence of repetitions, exaggerated pressure in the larynx and associated movements, sometimes amounting almost to chorea or ataxic movements in the vocal cords which are never seen in aphasia. In the functional cases Lichtheim's test is always well done, whereas in aphasia where the word images are disturbed this test is always poorly done. No difficulty should be found in differentiating hysterical mutism from sensory aphasia, the paraphasia, dysgraphia and dysarthria being sufficient to differentiate them. In the functional cases disturbances of hearing even one sided may be present which are never present in sensory aphasia. Another scheme for differential diagnosis is presented in outline. Another differentiating point is the fact that in hysterical deafness with mutism

there may be anesthesia of the drum membranes and the auditory reflexes such as the reflex of the vocal cord and the palpebral reflexes are always present in hysterical mutism, besides which these patients when singing are able to sing with the proper rhythm and tone if accompanied on the piano.

The author makes an interesting statement quoting Lermoyer and Muck, that a simple rupture of the drum membrane frequently seen in true shell shock cannot give other than very mild subjective disturbances of hearing and when these complaints are exaggerated and persistent they are nearly always hysterical.

There are no absolute differential signs between ordinary habitual stammering and the hysterical stammering of recent traumatic origin. When they are present the three differential signs of Froschel are valuable. This author says that habitual stammering is characterized by the presence of nasal voice and respiration, repetition, embolophrasia and not the simple syllable and consonant stammering of the recent traumatic speech defect. The author agrees with a number of authors that these cases of hysteria are "the roots of the same plant" as the malingerers; in other words, that they both are possessed of degenerative psychopathic personalities. He also calls attention to the fact that while one symptom may be simulated other signs in a patient may be hysterical. The non-simulated signs of hysteria are paralysis of the lower seventh, which usually occurs on the right side, paralysis or spasms of the vocal cords, restriction of the visual fields, the anesthesia tested by Erb's electrode and dermatographism. Patients who do not give themselves up to the ordinary treatment should be suspected of malingering. A man is not necessarily malingering if he presents bizarre or impossible symptoms because anyone of these may be present in hysteria. Single isolated symptoms therefore should not be depended upon, but rather the whole picture. The author lays great stress on the anesthesia of the tympanum in hysterical deafness and says that malingerers will react to great noises whereas the patient with hysterical deafness will not.

Pathogenesis.—This depends on the psychology of the individual, who may be possessed of a neurotic make up, hereditary taint, etc., even though added to this are the psychic emotive shocks, fears, passions, imitation, suggestion, etc. There is also a special psychic process both ideative and affective which gives rise to the hysterical reaction and its symptoms. A history of previous nervousness or nervous disturbances or hysterical attacks was elicited in 50 per cent. of the author's cases. The pure emotion or fear alone was found in 13 per cent. of the cases. In 80 per cent. of the cases disturbances of speech were provoked by exposure to shell fire or gas or to burial. The onset in 90 per cent. of the cases was sudden and in the 50 per cent. of the patients who were unconscious, the symptoms made them-

selves manifest immediately upon regaining consciousness. The author does not believe that the war hysterias following pure emotion and those following commotion are different at all. The symptoms and etiology, prognosis and end results are the same. There is no possibility of discovering localizing signs of brain injury in these cases. He recognizes however that hemato-myelias, cerebral and spinal hemorrhage, hematomas, etc., may occur from shell shock, but those cases are purely functional which have no signs of any of these organic injuries. He does not believe in the commotion neurosis concept of Vogt. He says "with what correctness therefore may one speak of an emo-commotion syndrome when there are present only the functional emotive signs"? The author states that the prolonged discussion at the Neurological Congress in Berlin and Monaco at which Nonne, Lewandowsky, Strümpel, etc., took part, has resulted in a decision that there is no special functional neurosis resulting from the war injuries. This is entirely contrary to Oppenheim's views. The author agrees with Lewandowsky that usually only the moderately severe or even slight injuries are the ones followed by functional nervous disorders rather than the severe types of head injuries. He believes that many of the symptoms of hysteria have a clear organic basis such as dysfunctions of the thyroid, suprarenals and the trophic and vasomotor disturbances. They however are symptoms derived by association or due to junction of the complex visceral and sympathetic innervation and therefore the so-called reflex paralysis cannot be separated from the common hysterias. In the author's cases symptoms of endocrino sympathetic disturbances were very rare. He saw only one case of Basedow's disease. He agrees with Monakow and Freud that disturbances of the affect are always accompanied by disturbances of the internal secretions and possibly also of the nervous system itself. The author disagrees with Babinski's views of pithiatism, imitation and suggestion and agrees with Lewandowsky that all the war neuroses are due to a psychologic (emotional) disturbance. He states that the fact that many of these cases become unconscious and that the hysterical disturbance follows immediately, demonstrates that Babinski's theory, that a conscious desire to be ill is the cause, cannot be true. The author's belief closely approximates that of Freud, namely, that besides the suggestive element there is always an affective psychogenic element which may be operating unconsciously to produce the symptoms by conversion. The author believes with Lewandowsky that even in the cases of suggestion which occur almost in epidemics, the emotional element is the main factor. He believes that suggestion would not explain all the phenomena observed in hysteria and asserts that conscious suggestion is absent in the majority of the cases even though a clear dividing line cannot be drawn absolutely between the elements of suggestion which are normally present in all of us and those which may

be considered as hysterical. The author agrees with Lewandowsky however in his objection to Freud's views that only sexual affects cause hysteria. The war neuroses absolutely explode this view. Hysteria caused by fear is now admitted by many of Freud's disciples, chiefly Ferenczi. The author agrees with Lewandowsky, Janet, etc., that there is a special hysterical make up or character. Janet calls this *abulia*. To Janet's conception of *abulia* the author adds the presence of a phobic tendency in these individuals, Dupre adds the presence of an infantile mentality. The hysterical character may be acquired by fatigue, suffering, fear, insomnia and many emotions alone or accompanied by the abuse of alcohol, tobacco and coffee. Emotions become pathological only when their durations are prolonged and frequently repeated. Single emotions cannot cause the war hysterias of acquired type. As factors predisposing to hysterical mutism the author mentions injuries to the tongue, head, larynx, etc.

The author believes that hysterical mutism is due to a cortical disturbance wherein the psychic impulse destined to cause movements of the peripheral apparatus for the emission of words is absent. Hartmann proposes to call this a form of *apraxia*. The same mechanism is at work in the production of the *dysarthria* and hysterical stammering and stuttering. These latter are caused more especially by a disturbance of association due to the idea of the difficulty of producing normal speech, the stammerer controlling the movements of speech, words therefore losing their symbolic value and being substituted by word images instead of speech. Added to this are the difficulties of breathing properly. The author believes that the patient's mind is controlled by an unconscious desire to lose or fear of having lost speech and that as a result the paralysis of the vocal cords, *dyspnea*, etc., may occur by means of a psychogenic *sejunction*.

Prognosis.—The period of regression is variable, it may be days, weeks or months. A sudden cure is very uncommon. The mutism is the most tenacious symptom. Even more difficult to cure are the primary and secondary *dysarthrias* (stammering and stuttering). The best results are obtained close to the front, some authors claiming 100 per cent. cures. The author's cases were seen in the neurological centers and a complete cure was obtained in only 60 per cent., definite improvement in 30 per cent. and complete failure in 10 per cent. Cases with preëxisting speech and hearing defects were the worst and the most apt to recur after improvement. Relapses are more apt to occur when rough measures are undertaken. Many cases of hysterical *dysarthria* become habitual. A complete cure of these cases was obtained in only 15 per cent., 65 per cent. of them being unimproved.

Treatment.—The author is greatly against brusque or rough methods of treatment such as strong electrical currents. He agrees that the method of Muck in speech defects may be very valuable. This consists

of placing a metal ball and occluding the vocal cords causing in this way a primitive reflex cry which results from the law of Wundt which states that a spasmodic expiration is always accompanied by a reflex cry. This method forcibly increases a weak expiration present in these cases and completely closes reflexly the glottis which can not be closed voluntarily. The author has used the passage of gastric sounds, forcible vomiting and gargling but the milder methods have given better and more lasting results. The author believes that persuasion, encouragement and systematic reëducation of breathing is the best method. Hypnosis is of very little value. He has used mild faradic currents applied to the larynx. No one method can be said to be the method. All methods are good.

The author disagrees with Lewandowsky that all cases can be cured. He especially does not believe Lewandowsky's statement that even the hysterical makeup can be cured. He believes that the best method of handling the cured cases is to place these individuals in the rear lines and the back areas doing manual and agricultural labor. It is never wise to give them leaves or to keep them in doubt as to whether they are going to be returned to the front.

MICHAEL OSNATO.

Obituary

CHARLES ARTHUR MERCIER, M.D. (LOND.), F.R.C.S.
(ENG.), F.R.C.P. (LOND.), BORN 1852, DIED 1919

The obituary of Dr. Mercier by Sir Bryan Donkin in the January number of the Journal of Mental Science gives a very fair account of the work and worth of Mercier, and in writing for an American journal I feel that perhaps a greater detail as to the personality than to the character as an author may be required. Mercier was essentially a self-made man, one who may be said to have passed through the lower social grades to the highest intellectual level. Born of a good middle class family and educated at the Merchant Taylors School, which is one of the best of the London public schools, where a sound classical education is given. Mercier, after leaving school for some years lead a hard and varied life. He was a cabin boy and on more than one occasion I have heard him speak of the hard and almost brutal conditions on board ship while he was a sailor. Later he became a clerk in the city; he used to say his earlier work was simply mechanical as he had to sweep out the office and keep it in order. I shall not forget the last occasion when I heard him speak in public. It was at the Mansion House, London, at a meeting of the Mental After Care Association. At the meeting with his usual brilliance he referred to his earlier life's experience, but he gave offence by saying he would rather go through it again than be a nurse at an asylum. This was quite natural behavior for Mercier, who would suddenly seize on some new idea and for mere fun he would grumble about it and it was often hard to recognize whether he was joking or trying to draw an opponent into an argument.

Mercier was a brilliant after-dinner speaker as well as a good debater. He was essentially a social man and loved to meet and argue with his fellows. He was not tolerant of bores. For many years he was a regular attendant at the meetings of the Casual Club which was a very free and easy debating society where there was no restriction as to the subjects discussed. A ready wit and rapid appreciation of his opponent's views rendered him a brilliant talker.

Mercier though not given to sport of any kind yet was full of interests. He was fond of music and played one instrument at least. He was fond of mechanical pursuits, turning and wood carving being among his pastimes. He was fond of gardening and at one time and another he had opportunities of exercising his gardening taste. A man of simple habits, temperate in all things, his one real joy in life was word spinning. He never seemed tired of writing and his fecundity was enormous. Writing for publication was a joy to him and the list of his books is great but besides books he was constantly contributing to various literary and scientific journals and the medical papers were always ready to receive contributions from him and he thoroughly enjoyed a wordy warfare with a worthy antagonist. He could be sarcastic and severe and as he had strong personal views it is not surprising that he had antagonists, I will not say enemies. He did not retain malice; he could hit hard or receive a blow in good humor. He was in some ways inconsistent. He wrote on logic but really he had no real understanding of the subject. In this case as in others Mercier would take up a definite position and he would hold it tenaciously even when other people saw he was wrong.

One example was his constant insistence on the inability of doctors in general and of alienists in particular to understand the difference between insanity and unsoundness of mind. Over and over again he maintained that he was the first and almost the only doctor who recognized the difference. He was also very dissatisfied with the use of the word "cause" in connection with diseases. He was in many cases justified.

He had his own views as to the classifications and pointed out that in all the textbooks there was confusion; part of the classification being causational and part symptomatological. I fear there never can be a natural classification of disease; it must always be one of convenience; but Mercier had no sympathy with compromise.

Mercier was married twice but he had no family and I do not think he had any real family instinct. His second wife was his most devoted nurse and companion during the later years of Mercier's suffering life. He began to fail with osteomalacia and slowly losing power and becoming very deaf yet even then with a smiling face he met the world. He fully recognized the fatality of his disease but it did not seem to affect his mental ability. He really for some years led the life of a martyr and was an example of patience and pluck.

There was a strong parallel between him and the late Dr. Henry Maudsley in their literary work and also in their asylum experience. Both had had some experience in mental hospitals and asylums and both had been attached to private asylums, both had very strong views on humane treatment of the insane, both looked forward to a time when greater liberty would be given to the doctor, for they, instead of the patients are still controlled too much. Maudsley and Mercier both wrote on the physiology of the brain and later on mental disorders. They were also authorities on mental jurisprudence and responsibility. Their opinions were frequently sought in doubtful cases of criminal insanity. They were also very strong advocates of the importance of recognizing conduct as the great gauge for mental disorders. Maudsley was in many ways the more scholarly writer and his extraprofessional literary interests were in Shakespeare. Both were students of Shakespeare and the Bible, being attracted by the fine English of the English version. From a religious standpoint, I should place them both as agnostics; at times both seemed to be more advanced but with age both seemed to recognize the limits of sensory observation. They had to recognize that there were many things not explicable, at present, on scientific lines. Both would have repudiated a creed but I know that Maudsley felt that he would have been happier if he could have found a foundation for faith.

On the medical side the philosophy of Mercier had different sources from those of Maudsley. Hughlings Jackson at the London Hospital did a great deal to develop the analytical side of Mercier's pathology and Herbert Spencer and evolution satisfied his philosophy.

He was not a great general physician but was capable of recognizing the work of others but he had to be fully satisfied before adopting new views. He was a good lecturer at both School of Medicine for Women and also at Charing Cross. His quaint humor and abundant experience were invaluable. Like Maudsley he had outside literary interests and wrote really learned books on "Astrology" and "Lepor Houses and Mediæval Hospitals." His works on Responsibility and Criminality were rewarded by the Royal College of Physicians. One of his most remarkable works was "Conduct and Disorders Biologically Considered." In some ways Mercier was misunderstood, for he would not admit that any mental disorder was really insanity unless it exhibited itself in changed conduct. From a medico-legal standpoint this may be ac-

cepted, but that a person with very marked and persistent hallucinations though he does not act upon them, is sane is hardly to be accepted. Nothing seemed to stimulate Mercier's literary anger so much as spiritualism and he wrote a kind of burlesque on the "Conversion of a sceptic" which led many to imagine that Mercier was a pervert. He enjoyed this greatly. It is hard to pass over the practical side of Mercier's life, though it has left little to mark it. He was a steady, conscientious assistant medical officer, but he was always aloof from the general pursuits of his colleagues and not being a sportsman he was respected but hardly appreciated. As superintendent of a small private asylum he was in every way good to his patients but he was not a really good financial manager and director. As a witness in courts of law he was at his best, perfectly straight in his replies but guarded and not inclined to say a word other than was necessary. He avoided definitions. A man is gauged by his friends. Mercier had very many and there was hardly a leading English physician who did not respect him. To conclude I will quote Sir Bryan Donkin's epitaph:

"In the fell clutch of circumstance,
I have not winced nor cried aloud
Under the bludgeoning of chance;
My head is bloody but unbowed.

It matters not how straight the gale,
How charged with punishment the scroll,
I am the master of my fate
I am the captain of my soul."

GEO. H. SAVAGE, K.T., M.D., F.R.C.P.

The Journal OF Nervous and Mental Disease

An American Journal of Neurology and Psychiatry, Founded in 1874

Original Articles

MENTAL DISTURBANCES IN LETHARGIC ENCEPHALITIS¹

BY ISADOR ABRAHAMSON

ASSOCIATE NEUROLOGIST, MT. SINAI HOSPITAL AND VISITING NEUROLOGIST, MONTEFIORE HOME, NEW YORK CITY

The toxins of lethargic encephalitis act as a poison to protoplasm. This poison attacks all cells, individually and in mass. Under its influence cell life becomes torpid; the functional activity dependent upon it lessens, and the correlation of that activity to the needs of the whole cellular confederacy becomes deranged. Irritability both to internal and external stimuli diminishes, and the vital tone of the afflicted host lessens.

All cells are not equally vulnerable to the toxins of lethargic encephalitis. The main brunt of the attack and of its consequences falls upon the most delicate human cells, the nerve cells. Functional correlation which is chiefly nervous therefore suffers more than that which is partly under chemical or mechanical control. Other things being equal, the more extensive the nervous mechanism on which a function depends, the more certainly and severely will that function suffer in lethargic encephalitis. Thought is a function wholly dependent upon cerebral nerve cells. It is, therefore, a function which must inevitably suffer in this disease; and lethargic encephalitis invariably gives rise to mental disturbance. The superficial form of the disturbance varies in the same case according to the stage of the disease; and in different cases accord-

¹ Read at the Stated Meeting on Lethargic Encephalitis, at the New York Academy of Medicine, May 20, 1920.

ing to the severity of the infection. Somnolence and insomnia, mania and depression, delirium and coma, confusion and catatonia may all be observed; but these are essentially variations in the severity and phase of the disturbance, not in its nature.

At the onset of the disease there is a period of variable duration in which the patient experiences increasing difficulty in attending to his work. Next, a time of yawning ensues, in which there may be also the irritability of the overtired. Then the eyes close, sometimes chiefly from lack of interest and from desire for sleep, sometimes from weakness or paresis of the upper eyelids; sometimes from photophobia, and often from a combination of these several factors. The patient, with eyes closed, dozes and wakes, and dozes and wakes again, and has less than the normal appreciation of the passage of time. As a rule, the patient lies on his back with closed eyes as if in peaceful and deep sleep or trance. He may neither move nor utter a sound for hours. His pulse, temperature, and respiration may all be of normal character. He may display neither conscious nor unconscious initiative. The discomfort of a wrinkled sheet may not cause him to alter his position, and derangement of his coverings may not arouse him. Yet from the depth of this seeming slumber, he may respond immediately when questioned and his short but coherent answers show no loss either of memory or of orientation. He has no tendency to perseveration. His answer given, he straightway resumes his seeming sleep. If ordered to perform a simple movement, such as protrusion of the tongue, he may obey without hesitation, make the ordered movement, perhaps slowly and stiffly, and then relapse again into somnolent immobility. He proffers no requests, asks no questions, and seems to have little concern for the gravity of his state. But his attitude expresses a desire to be left alone, a desire which is sometimes articulate in him. He will, when the act is required of him, rouse himself to empty his bladder, if he can; but such visceral demands seem to have lost their inherent power to command satisfaction from him, for he does not spontaneously seek relief, neither is he incontinent, although sometimes a slight leakage of urine occurs.

The depth of the somnolent state has no correspondence with the blood picture, the blood pressure or the temperature. This somnolence may last for days or weeks.

The somnolence usually disappears, consciousness broadens again, the interest of the patient in himself, his malady, and his

environment, gradually awakens, and a period of mild depression ensues. In this period the eyes may remain closed, but the patient voluntarily changes his position, and spontaneously gives vent to longings and complaints. His chief complaint is of utter weariness and of inability to find refuge from that weariness in sleep. In spite of his closed eyes and his sensory isolation, he bemoans himself as one condemned to an unhappy and unending vigil in which there is no oblivion. And this state of self-commiseration, weariness and sleeplessness wears off very slowly. Sometimes to the somnolent immobility chorea succeeds, and rapidly induces exhaustion.

The somnolence may deepen into a stupor, from which the patient is not easily aroused to conscious response. This stuporous state resembles very closely a drug intoxication. In the night watches, when life's vital tide is at its lowest ebb, a restless delirium of inconstant severity often appears. Spontaneous movements and sounds are made. The movements are purposeful, grasplings and pointings at unseen things, tossings and turnings. The sounds are mutterings, ramblings and cries—often incoherent, and sometimes maniacal. In the quiescent intervals the patient lies like a log. He may still be roused by insistent command to action of the simplest kind, but even the slight spontaneity observed in the earlier somnolent state has now disappeared and in its place automatic responses characterize speech and action. There is a complete lack of emotional expression, while such responses as are elicitable tend to perseverate. The face, waxen and corpselike, remains an impassive and inscrutable mask. The voluntary muscles are somewhat rigid but by manipulation the limbs can be made passively to assume unusual attitudes which they tend to preserve. In other words, the patient passes into the state which is known variously as catalepsy, *flexibilitas cerea*, narcolepsy or catatonia, according to its severity.

This state may pass away leaving confusion, faulty orientation and memory loss of the Korsakoff type. It also as a rule, leaves a very real depression, a depression in which there may be anorexia, with many other inhibitions, and lack of initiative and perseverance, as well as confusion and extreme poverty of thought.

Or the stupor occasionally deepens into coma, which, as a rule, ends fatally. The coma presents no features distinguishing it from coma in other diseases. Besides, this unbroken sequence of somnolence, stupor and coma, indicating that the coma is but the culmination of the effect of a continuing action, the coma may also appear somewhat suddenly, as a terminal phenomenon, and be due, not so much to the specific poison of lethargic encephalitis as to acidosis.

This mental disturbance has received special study from several observers, among whom MacNalty alone has attempted to explain it. MacNalty calls attention to the fact that the number of routes by which sensory stimuli reach the brain is anatomically limited. In man, sensory impulses stream into the optic thalamus, and thence to the cerebral cortex. On their way to this distributing center in the thalamus, the impulses pass by paths which lie in close proximity to the nuclei of the third nerve in the crus cerebri. From the third nerve, fibers pass upward in close relation to the sensory fibers conveying impulses to the thalamus. According to MacNalty, lesions in the neighborhood of the thalamus, or of the third nerve nuclei, may cause ptosis, and place the patient in darkness, may block the paths by which sensory stimuli stream convergingly towards the sensorium, may shut out from consciousness impulses that arouse and stimulate it, and thus bring about a condition of rest and dark and quiet, a condition conducive to somnolence and stupor.

The mental state is not a physiological entity even if it be discussed in terms of lesions at levels or in spheres or areas. Thalamic lesions from other causes do not produce the mental state of lethargic encephalitis. Absence of sensory excitation tranquilizes; but the blind tabetic is not somnolent; and the closing of the eyes by ptosis in lethargic encephalitis is not a more effective barrier to light impressions than is blindness; neither is the sensory loss in lethargic encephalitis comparable with the sensory loss in tabes.

Somnolence may be favored by such lesions as reduce the number of sensory impressions going to the cerebrum. It can, however, arise independently of such lesions. The depth of the somnolence and also its duration are unrelated to the severity of the lesions. While the lesions persist the somnolence, as a rule, passes. In other words, the somnolence has no demonstrable dependence upon the focal cerebral lesions of lethargic encephalitis. Nor are the other manifestations of the mental disturbance in this disease referable to inflammatory sites in the central nervous system. The extent of the mental disturbance bears no correspondence to the extent of the lesions, the amount of fever or the blood picture. The mental disturbance in its nature, in its development, its course, and its disappearance, is typical of an intoxication. It is not essentially due to invasion by the protozoa of lethargic encephalitis, of particular localities especially associated either directly or indirectly with the attribute of consciousness. It is due to the specific action upon the nerve cells of the cerebrum of a toxin or toxins secreted by the protozoa of lethargic encephalitis.

Psychic processes are revealed to us through their externalization. The organ of their expression is the musculature. We infer the mental state mainly from its motor reflection in movement and posture. In lethargic encephalitis the immobility of the patient plainly indicates a retardation, restriction and degradation of the associative processes, to a level where such ideas as are conceived do not disturb the confirmed mental attitude which immobility reflects.

This mental attitude or "set" not only prevails against any conceptual activity which may spontaneously develop in the sphere of thought, but also persists in spite of stimuli which arise from the patient's environment and to which he normally would respond. Such stimuli entering the brain, excite sensory images, which there, linking with similar sensory images imprinted in memory by past experience, evoke sensations that may command attention and thus modify the prevailing "set" of the associations. The urgency of such claims for attention depend not merely upon the number and strength of the associations which the claimant sensation can evoke, nor even upon the demand for attention offered by competing sensations of other orders, but also in large measure upon the available store of attention.

The closed eyes of the early stages of lethargic encephalitis certainly cause a decrease in the visual impressions, and diminish the external stimuli that normally awake attention, arouse interest, and evoke thought and action. But even with a quiescent visual field, sensory stimuli from all over the body are streaming constantly into the brain of these somnolent patients. Such stimuli may be of abnormal intensity. The integrity of the sensory conducting paths may be demonstrable. The ability to move may be unimpaired. And the power to empty the bladder may be undiminished. Yet the patient may lie impassively upon a distressingly crumpled bed, and a full bladder may make in vain a demand for evacuation that is normally imperative.

In other words, sensory stimuli stream into the brain and the brain ignores them. In spite of them, the prevailing "set" of the psychic associations persists. If these peripherally excited sensations could command attention the prevailing mental attitude would be modified so as to inhibit contrary associations of the existing order and to facilitate associations favorable to the new order of the claimant sensation. All the attributes of the successful sensation would become manifest in varying degree; and among them its

motor equivalent, which would achieve the dignity of the dominant, central, postural image. The evocation of this dominant, central, postural image would excite in turn its component images. These would pass from the field of consciousness to stimulate the cells of the motor area of the brain. And the impulse excited there would be conducted through the appropriate nerve channels so as ultimately to express the dominant sensation in muscular changes.

But in lethargic encephalitis no perceptible muscular change may occur. The full bladder and crumpled bed may be ignored. The patient may be outwardly as indifferent to them as if they concerned only the nurse. His bodily comfort no longer interests him. The vitality of his brain cells seems to diminish until enough energy no longer remains to induce him to attempt to liquidate the incessant sensory demands. His eyes close on all outward things. Such sensory images as are peripherally excited, owing to the depreciation of associative irritability, lose their intensity and awake in memory merely pale shadows of themselves. Not only the store of available attention but also the power of new sensations to draw upon it is decreased. What occurs is not so much a reduction in the number of the rousing sensory stimuli, as a diminution of the intensity of the sensations they excite and an ignoring of these sensations by a consciousness restricted by the paralyzing action of the toxins of lethargic encephalitis. So the patient lies an inert and irresponsible mass.

Change implies a choice, a discarding of the existing for the new; and an inhibition of prevailing associations with a facilitation of the chosen. The somnolent lethargic patient usually awakes from his trance to respond to personal questions and commands. Few stimuli so powerfully arrest attention as auditory stimuli. Indeed, in a patient with closed eyes the auditory is probably the most delicate sensory field. But apart from their imperative nature, such auditory stimuli remove the barrier of choice. The patient overcomes his psychomotor inertia, inhibits the existing associations and facilitates those pertaining to response commanded.

From such responses we gather that the associative processes, though slowed and restricted in scope by the lethargic encephalitis toxins, are still orderly. The responses may show a minimum adequacy but they are correct. Simple movements may still be performed on command. The central image of the desired posture must, therefore, be perfect; the power to evoke the related postural images in series, to "set" the associations, must be intact; the after

images of the movements, the images which are evoked by stimuli returning from the moving part, must suffice to neutralize the central after images, and to satisfy the critique, for the movement is thriftily accomplished and not repeated. The dominance of the associations evoked by the command end with its fulfilment. And in its place the preëxisting "set" is reëstablished, for the patient resumes his trancelike inertness. Later, the response to the command becomes somewhat hesitant and may be faulty, while still remaining fairly effective. The power to change the "set" on command is apparently failing, and with it the facilitation of the commanded associations. Still later, the commanded movement tends to repeat itself (to perseverate), and the required attitude to persist (catatonia). In other words, the central after image of the commanded posture tends to remain dominantly active. The associations remain "set" for the persisting posture or group of postures. This morbid "set" may be due in part to the absence of the retro-active inhibition normally exerted by motor expression, in part to the inadequacy of the peripheral after images of the movement to neutralize the central after image of posture evoked by the command, and in part to the failure of the reviewing faculty of the critique. But it is probably mainly due to a lack of associative capacity. The greater the number of the associations of a postural image the more it resists suppression and the more it tends to continue its motor manifestations. The few associations of the stereotyped series of postures could enable that movement to remain in active and undisputed possession of the narrow field of consciousness, only if there were no competition, only if there were an almost complete lack of other conceptual associations. Such an effective suspension of associative activity would result if the toxins of lethargic encephalitis raised the resistance at the synapses of the cells of the psyche, to a height which prevented all ordered flow of associations.

This synaptic interruption probably occurs, for at this stage there also arise the hallucinations and delusions which are associated with the stupor, and are characteristic of low states of consciousness noted in other infectious diseases or induced by the actions of drugs such as opium, hashish and similar narcotics.

MacNalty asserts that this combination of delirium and stupor "has a simple explanation. Normally it is by the perception and appreciation of such stimuli that the conduct of the individual is guided and controlled. These stimuli are inhibited when there is an

attempt upon the part of the patient towards cerebation and overcoming of stuporous condition. At such times he is deprived of the perceptions which normally regulate his conduct. Cerebation, reinforced often by subconscious stimuli, no longer repressed, ranges wild and uncontrolled—that is, the patient is delirious.”

The explanation is probably not so simple. The weakening of conscious control which may accompany sensory loss is caused chiefly by the uncertainty and anxiety which that loss engenders. From that uncertainty, hallucinatory or delusional interpretations of sensory happenings develop gradually out of a conflict between the imperfect sensory impressions of present experiences and the memory associations of proved, established and accepted past experiences. Delirious subconscious cerebation springing solely and suddenly from withdrawal of the customary critical support which sensory impulses give to balanced mental activity, is not within accepted knowledge. And in lethargic encephalitis there is no abdication of consciousness, no usurpation of conscious action by a subconscious cerebation.

We are practically ignorant of what passes in the trance of lethargic encephalitis, beyond what is vaguely revealed to us by the musculature. And when the trance is interrupted by hallucinations, these may surprise but do not inform us. We cannot compare the mental pictures of the consciousness of the victim of lethargic encephalitis with personal experience. What is disclosed of them is usually too fragmentary for analysis. The hallucinations seem to differ in few respects from those seen in other profound intoxications. We have seen that the associative and perceptive faculties are not retained and that consciousness is clouded, and greatly restricted, so that on command it becomes exclusively occupied by the response; and volition is practically suspended. The hallucinations, therefore, probably rise, unsought. They arise, moreover, not as exaggerated visual ideas, for all ideas are minimized, but as essential hallucinations, which whether of strong or of weak imaginative force, are the product of the intoxication. Most of the observed hallucinations are visual. Some of them seem to be endowed with all the elements of reality, for the patients point and grasp purposefully at unseen things. The critique is, therefore, lacking.

The part of the cells chiefly affected by the toxins of lethargic encephalitis is not as yet determined. The frequent absence of recorded changes in the cell body may indicate merely imperfect technique or incomplete histological examination. It may, however,

signify that the synapse is the portion of the cell which has the greatest chemical affinity for the poison of lethargic encephalitis, and which suffers earliest and most in the attack. But any poison which reduces the vitality of the cell, *ipso facto*, heightens the resistance at the synapse. And the persistent sequence of severe intoxications, the psychoses, the Korsakoff phenomena, and even the protracted recovery show that in addition to nutritive changes, actual structural disturbances may also occur—a true inflammation of the brain cells, with destruction of the cellular processes.

129 EAST 69TH STREET

THE ANATOMICAL IMPLICATIONS OF THE INTRO- SPECTIVE PSYCHOLOGY¹

By HAROLD I. GOSLINE, M.D.

FORMERLY INSTRUCTOR IN NEUROPATHOLOGY IN THE HARVARD MEDICAL SCHOOL

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¹ The first part of this paper, that on Introspective Psychology, would have been impossible had it not been for the publication of the Psychology, General and Applied, by Hugo Münsterberg. Indeed, it may be said that this paper is merely a group of deductions based upon that work. Hence, the author feels responsible only for his understanding of the work and the deductions which were suggested to him in the light of known anatomical facts.

1. A study of the literature and a knowledge of the aims and methods of medical psychology, temporally remote or recent, does not reveal a trace of the influence of introspective psychology even till the present time. It may not be amiss for this reason to suppose that medical men are totally ignorant of this part of the great field of psychology, a field which has yielded so much of recent years on the interpretative side and to the purposive thinker, the tender-minded type of personality.² The introspective psychology must appeal to the causal thinker, the toughminded type of personality,² and it must expect the same opposition from the former type as the interpretative psychology has already met from the latter.

2. Introspective psychology is a science founded upon certain fundamental assumptions like any other science and with these postulates it integrates the material at hand, namely the mental processes, till it comes upon facts which are incompatible with its postulates. Till then the postulates must stand.

3. Consciousness is the logically necessary point of reference. Consciousness is the reviewing subject and the subject does not change. It is the objects of awareness that change; it is the mental processes that change and not the awareness. The subject, the consciousness, the awareness can not do anything to the contents of consciousness; it can only be passively aware of them. The subject, the consciousness, the awareness is the knower and the self which is known is something different. The self which is known is that central, unified content of consciousness which is influenced by the world and which reacts upon the world.

4. These are the proper postulates of introspective psychology. To them are linked certain essentials of physiology in that the elements of our psychological life are found to depend upon processes of stimulation, association, reaction and inhibition which are inherent in the dispositions of the organism. They are the properties of the cell or of complexes of cells such as exist in the nervous system where they have been studied by the physiologists, notably Sherrington,³ Canuon,⁴ and a host of lesser lights.

5. It is not the purpose of this paper to stand as an exposition of introspective psychology. That would require a different cast. But it is necessary, in order to present a basis for our anatomical

² Referred to by E. E. Southard, *General Psychopathology*, Psychol. Bul., June, 1917, Vol. XIV, No. 6, p. 206.

³ Sherrington, C. I., *The Integrative Action of the Nervous System*, New York, 1911.

⁴ Cannon, Walter B., *Bodily Changes in Pain, Hunger, Fear and Rage*. Appleton, New York, 1915.

conclusions, to analyze briefly the mental life to its elements. Hence, with the statement of the postulates, let us proceed to an analysis of the personality itself, from this point of view, and having presented the analysis by introspective psychology, let us then draw our anatomical conclusions.

PERSONALITY

6. It will appear as we proceed that we are not attempting to describe personality so much. That is perhaps the work of the behaviorist. We are rather dealing with an idea (38-41).⁵ In fact, personality can exist for the introspective psychologist only as an idea, for he deals with the contents of consciousness. We are attempting to give an introspective account of the development of the personality idea; we hope to reduce the personality idea to its elements. This attitude (21) is difficult to assume as it is unusual to many psychologists not to mention medical men who have been dealing chiefly with interpretation, a thing which demands an entirely different attitude, an entirely different nervous setting.

Self and Selfconsciousness

7. Perhaps the most essential of all the objects of awareness of the consciousness is the self. It is certainly the most outstanding of the objects presented to the introspective examination of the personality. We know ourselves as one of the innumerable objects of which we are conscious. This knowledge began just like that of other things in the world; we perceived ourselves by groups of sensations (54-74). The feeling that the self takes a rôle which is incomparable to that taken by other objects of awareness is due to the fact that the self takes the central place in every experience and that at the same time the body actions carry out the desires (24-27). The self becomes the center of visual, tactual, kinesthetic and organic sensations.

8. Next the consciousness of identity in successive periods, the memory, develops (33-36). And this ability to reproduce our earlier experiences and to make use of knowledge acquired earlier—reaction (79-82)—links our whole life subjectively.

9. Reaction is limited to things perceived (42-52) and things perceived depend upon the bodily personality. For this reason, perceived and remembered objects appear to be in the bodily personality along with the feelings (15-17), the emotions (18, 19), and the

⁵ Numbers in parenthesis refer to the paragraphing of this article.

volitions (24-26), as well as outside in the world of space and time. And as soon as this content of consciousness is considered as something existing in the body it can be contrasted with the body. Thus the mind comes to be considered as the man and the body to belong to external nature. However, the true self is not in the memory (33-36) but in the central functions of the mind, that is, in its attention (28) and will (24-26).

10. The enlargement of the personality idea depends upon the circumstance that the body is the central agency which acts and which can not be affected without a feeling of response. Thus we feel that the personality is not enclosed by the skin but it becomes the individual with his whole social setting.

11. So analyzed, the self-consciousness is seen to have its elements in sensations, associations (memory), reaction and its centripetal effects, and inhibition (the inherited dispositions).

Unity and Variations of Personality

12. There are two other peculiarities of the personality which present themselves. The personality is unified and it undergoes variations even in its unity. Let us determine the elements of these phenomena.

In considering the unity of the personality we know that we are only dealing with a complex interplay of perceptions (42-52) with the memories (33-36) fancies (37) and symbols (38-41), classed as ideas, with the feelings (15-17) and emotions (18, 19), classed as inner states, and with the acts of attention (28), of thought (29-31) and of will (24-26), classed as inner activities. The states and activities of the individual are completely controlled by the ideas and perceptions and themselves control the ideas which are to arise and the perceptions which are to be admitted. This mutual interdependence is the essential feature. We can not possibly understand the psychology of the personality by mere associative processes. Moreover, the theory of the subconscious is vague, is a poor makeshift, contradictory in itself and unfit to render the aid for which it is constructed. Only introspection under experimental conditions has worked out how far motor functions are not only externally attached to ideational ones but are themselves the causes for the vividness of the ideas, the attention (28). The personality's thinking is as much the product of its actions as its actions are the product of its thought.

13. Personality develops steadily and it may decay. But funda-

mental traits, the type of reaction (79-82), the tendencies to feelings (15-17) the trained attention (28), the rhythm of response, the energy of inner activity (24-31), that is to say, the temperament, the character, the intelligence, which are taken to be terms synonymous with the foregoing, are inborn and developed by training and these mould the outer world for the individual. Each man lives in the world which his inner dispositions select and shape.

14. As we proceed it will be seen that the unity of the personality is thus reduced to centripetal and centrifugal processes and that the variations take place in centripetal and centrifugal paths also; depending upon the inborn dispositions and the training. We have done with personality when we have thus reduced it to its elements. But in our analysis we have spoken of the interplay of perceptions (42-52), ideas (32-41), inner states (15-23) and inner activities (24-31). Let us next present the results of the analysis of our inner states.

INNER STATES

15. We have here to deal with simple feelings, emotions and attitudes as our inner states.

Simple Feelings

The most elementary simple feeling that we can find in consciousness is that of pleasantness or unpleasantness which is attached to simple sensations (54-74). These feelings are to a high degree subject to personal conditions, to chance habits and to passing influences. But we may expect the same regularity in the appearance of a pleasant or an unpleasant feeling which we know in the sphere of the sensations, barring personal idiosyncracies which have their parallel among the sensations in the seeing of the color-blind. We can trace exact relations between the quality and intensity of the stimulus and the character of the feeling. Character of feeling depends upon duration, spatial extent, alteration and most of all, upon the combination of the stimuli. Feelings represent the needs of the organism and hence lead to the most significant reactions (79-82) of the organism. The fundamental human needs remain to a high degree constant and the more closely related to the physical and chemical conditions of life, that is to say, to the needs of the organism, the stimuli are, the more constant are their feeling effects.

16. The feeling reactions to pleasant and unpleasant stimuli are

movements of approach and withdrawal. There are also opposing reactions in the respiration, in the rapidity and character of the pulse, in the size of the capillaries, and in glandular activity but the flexor and extensor contractions stand foremost as they have immediate practical bearing. By training from childhood the kinesthetic sensations (70, 71) come to fuse with the perception of the stimulus and so give the impression its feeling value. But more than this, the feeling sensations are given by the central changes connected with the arousing of the movement impulse, the reactions (79-82). The excitement becomes pleasant or unpleasant if it is starting a movement of approach or of withdrawal. The pleasantness or unpleasantness of the sensations is really a part of the sensations themselves; but they receive their color secondarily from our consciousness of the action by which the stimulus is continued or discontinued.

17. The feelings are not confined, however, to the pleasant and the unpleasant. We have feeling of tension and relief, restlessness and repose, excitement and depression. Even the satisfaction in various sensations is not the same. These points of common knowledge are elucidated as soon as the relation of the inner states to the motor impulses and the psychomotor settings is considered. Both the centrifugal innervation and the central association of kinesthetic elements must be different when we fixate a color, listen to a sound, and so on. We have just as many kinds of feeling states as we have ways of reacting.

Emotions

18. In the complex emotional states, also, the intimate relation to the centrifugal processes (79-82) is so evident that no description of emotion can leave out the actions of muscles, blood-vessels and glands and their conscious effects. First we become conscious of the sensory effects of the bodily reactions (79-82). But secondarily the central impulses to these contractions or gland activities can not start without changing the setting of the sensory centers from which they were stimulated.

19. But into our emotions there enters another factor which does not enter into the feelings. Exactly the same movements may enter into very different emotions and produce contrasting effects on account of the different ideas (32-41) which are combined with them. It is a characteristic combination of ideas and psychomotor results (79-82) which gives the richness to our emotions. And the emotion in its turn is useful for the action. It makes all the re-

sources of the individual useful to one end. The special actions required for this occur largely in organs outside our voluntary control. Only in this sense can they be called instinctive. They are automatic and any other use of the term "instinctive" is interpretation on the part of the observer.

Attitudes

20. The inner states so far presented demand a practical attitude. The most complete contrast to the practical attitude is the esthetic attitude. Next, in order of contrast, is the intellectual attitude. The perceptions (42-52), memories (33-36) and ideas (32-41) find us prepared for entirely different kinds of responses. The responses are complex and corresponding to them we pass through rich esthetic feelings. But we do not change the world. Thus we lack impressions which would otherwise be produced by the change in the outer world. No external effects are to be reached. Every external response is inhibited (83-85). The impulse to act is felt but is detached from the idea (32-41) of our own practical personality (6-14). The inhibition of the movement impulse eliminates the idea of the self (7-11). The feeling of action (24) associates itself, not with the behavior but with the impressions. Beauty in nature or art comes when all these energies harmonize. It is the harmony and unity of our own responses (79-82) by which we become aware of the unity of the beautiful object. Where art simply imitates life the esthetic attitude is impossible.

21. In the intellectual attitude the goal is the service of truth without reference to likes and dislikes (15-17). There is an inhibition (83-85) of associations (75-78) and reactions (79-82) controlled by personal desires. An end state is reached in the thought process which becomes a new foothold for action. It is a setting by which only such combinations (75-78) of ideas (32-41) can become effective and only such acts of affirmation (24-26) can arise as are in agreement with the totality of the knowledge (33-36) at our disposal. A reflective setting arises with kinesthetic sensations as its fringes, an influence on the sensory centers of the changes in the centrifugal paths. Thus we are conscious of every variation in this setting for truth.

22. The moral attitude refers to the relation of man to man and does not require different processes.

23. So, in summarizing the analysis of our inner states, it appears that the simple feelings depend upon sensation, that is, upon

the physical character of the stimuli, upon reaction which gives them their manifoldness, upon inhibition which is influenced by the glandular and vascular state; that the emotional states depend upon the same factors plus ideas (32-41); that the esthetic attitude depends upon sensation, reaction and chiefly inhibition and that the intellectual attitude also depends upon these plus ideas (32-41).

INNER ACTIVITIES

The Impulse Feeling

24. In our consideration of the inner activities we must first present the analysis of the impulse feeling. This feeling does not depend upon the effects of external movements. It is best recognized in the word "will" which is the common factor in attention (28) and thought (29-31) and in constructive imagination, as well as in desire and impulse, decision and choice. The will must also be looked upon as an objective process and be resolved into elements which are themselves without will character. The process of inner activity is constituted by the form of combination. Two conditions are necessary, namely, a change and an idea (32-41) of the result of the change. With this there is an act of decision, a feeling of impulse, which is given by the first movement of the total action unified by the goal idea. Later, it is a kinesthetic idea of the first movement of the action which becomes the feeling of impulse. We can have no impulse feeling for an action which we have never performed. Practically, the end before the mind is not the movement itself but the result of the movement, a change in the outer world which is perceived (42-52). This idea of a change in the outer world takes the place of a special impulse feeling and an action not in harmony with this idea would be felt as an involuntary action.

25. In the case of a rivalry of motives the end must be in consciousness whichever action is performed or the choice is involuntary. There is a greater feeling of self-participation (7-11). Each of the two anticipated ideas is influencing the channels of discharge. One group may offer less resistance or be strengthened by accessory physiological processes, associations (75-78) and so on but it is the setting toward a goal which is decisive. This power of the idea to set toward a goal is known as its "determining tendency." Its influence outside of consciousness seems to be that of an automatic reaction. This automatic character is acquired from the inborn dispositions plus the training. But the action with the preceding idea of the end gives us the feeling of self-participation which

exists in the simplest will action and which is most fully developed in the action of choice.

26. The complex actions merely involve resolution into simpler partial ones and an idea of the end for each is associated with the fitting response and practised till all work into the complex whole. The strongest force in this development is the pain and pleasure feelings (15-17). This is especially true of decision while many will actions of everyday life take place without feeling accent.

27. Instinct actions may be automatic, volitional, or choice actions but psychologically they offer no new elements. Only in instinct actions the ends which precede the action in consciousness are not really the final ends of the whole action. The observer decides what the end really is; and hence instinctive action is merely an interpretative syllogism. Automatic and feeling actions are conditioned by the inborn dispositions of the nervous system and the rest of the body plus the training.

Attention

28. The experience of inner activity depends upon the consciousness of a change in ourselves, preceded by the idea of the effect. In the cases just considered the change perceived is a body movement (79-82). In the case of attention it is the shifting of ideas (32-41). Memories, imaginative ideas or general ideas may arise by mere association (75-78) and are then involuntary. But our memory, imagination and thinking are most often preceded by a consciousness of an end. The end in view in every act of attention is to get more of the attended thing. Four processes are involved. First the content becomes vivid. Second, objects not attended become less vivid, are inhibited (83-85). Third, mental and physical activities start from the attended perception (42-52) or idea (32-41); impulses (24) to bodily movements (79-82), trains of thought (29-31), associations (75-78) and feelings (15-17). Fourth, bodily adjustments to the center of attention send kinesthetic sensations to consciousness. These may be reproduced ones but they all give the feeling of personal activity in the process of attention. These four processes are not the result of attention but are the attention itself. They are not a chance combination but they belong together of necessity. The vividness of one content and the inhibition of others are only the two parts of the reaction process (79-82). And the bodily adjustments themselves are only parts of the movements by which the system responds to the attended object. The

inner setting for a particular kind of attention is the result of our whole inborn disposition and our training.

The difference between voluntary and involuntary attention is only one of motive. In the former the inner activity awakes immediately while in the latter it is led to by associated (75-78) ideas (32-41) or feelings (15-17).

The Thought Process

29. The process of "getting more of it" may be developed to any degree of complexity. Here come all the relations which the mind can add from earlier experiences (75-78). The total process is thinking. The thought process is thus a prolonged attention process under the control of the idea (32-41) of the needed response. This anticipation of the final situation gives the feeling of inner activity and precedes the thought as an idea with determining tendencies. So, in the thought process also, the most powerful element is the preparatory setting. Images, kinesthetic sensations, words may be its adjuvants but they are only secondary.

30. Thought and imaginative thinking differ only in the attitude. One is practical, the other emotional. Thoughts stand in the service of reality. Imaginative thinking stands in the service of the feelings.

31. Once again we have analyzed to sensations, reaction, association and inhibition. Only, in the case of the inner activities, the sensations are kinesthetic plus those aroused by the outer world and the inhibitions are ideas with determining tendencies, given by the constitution and training of the individual.

IDEAS

32. Let us next examine into the elements of ideas, the memories, fancies and symbols spoken of in the presentation of the unity of the personality (12). These are not given immediately through our senses as the perceptions are. The chief elementary process in them all is association (75-78) and yet they are not the mere product of associational processes for the associative process itself is based on that of stimulation (54-74) and involves reactions (79-82) and inhibitions (83-85).

Memory

33. Memory ideas have certain peculiarities in their appearance and there are individual differences in them but they always renew

previous perceptions (42-52). They may be aided by kinesthetic sensations (70, 71) produced anew by reaction movements (79-82) but they must always maintain a reference to the past. This, a form of reaction, together with the facts of recency, frequency, vividness (28) and emotional impressiveness (18) in connection with the memory process, demonstrate the importance of the reaction process (79-82) in the memory process. The fact of common knowledge that certain ideas and perceptions, called the constellation, prevent the presence of others, shows the rôle of inhibition (83-85).

34. The elements of expectation (42-52) are the same but the reaction (79-82) is to the future. This difference in attitude (79-82) (compare 20-23) gives the futurity value to expectation.

35. A mere reproduction of qualitative elements without reactive setting gives a neutral time value.

36. The present is determined by the kinesthetic sensations (70, 71) coming to consciousness at the moment under consideration.

Imagination

37. The same differences in attitude (79-82) (compare 20-23), give time value to our fancies, the imaginative ideas. The elements have just as material character as the memories (33) for the wildest imagination can not develop contents which do not arise in earlier perceptions (42-52). But memory ideas are controlled by objective reality (54-74) and imagination is controlled by subjective demands, feelings (15-17), emotions (18, 19), interests, wishes. The poet or the scholar is controlled by the same elements but the setting differs. The one satisfies an emotional demand (18, 19), the other tries out his hypotheses by objective truth (54-74).

General Ideas

38. General ideas are epitomized by the symbols, words. They are composites of memory images (33-36) at times, but more often they are abstracts of such images unified by the motor setting of preparation for further developments. This attitude is the essential condition by which the word with or without its representative image, gains the value of a general idea. The attitude itself shades the central process (79-82) (compare 20-23).

39. A concept comes in the same way by acting as a demand to admit only such ideas as suit the definition. This is reaction and inhibition again.

40. None of these ideas can mean anything outside of itself as long as we deal with causal psychology.

41. Thus our ideas are seen to be elementary in association, stimulation, reaction and inhibition.

PERCEPTION

42. In the consideration of perception we find that perception is unified and that there are complex perceptions, namely, space perception, time perception and the perception of meaning. In all these, sense stimulation (54-74) plays the leading rôle. Peripheral senses and inner sense organs are the sources of these impressions and every perception involves many sensations. What binds our groups of sensations together into a unified perception is our attitude. It depends upon us how a perception is limited in space, time, number and manifoldness. Associative material (75-78), memories (33-36) and so on enter in also, but only enough to make our unified reaction possible.

Space

43. The psychologically most important combination of elements is the perception of space. Unaided introspection gives very wrong results here, but the experiment shows the true elements. Combinations of sensations (54-74) such as come from perspective, lights and shadows aid, as do also our memories (33-36) of the sensations given us by the objects in previous days. But the real fundamentals lie in the constitution. It is the difference of the retinal images which produces the effect of nearness or remoteness. Double images automatically cause action of the eye muscles and fixation of attention (28) on the single images. The same effect is produced by one eye alone by the action of the ciliary muscles in accommodation. Every single retinal area is related to a definite muscular reaction.

44. Tactual space perception is related in the same way to movement. So we can go to every known sort of space and we find that there is no perception of space in which muscle activity is not originally involved.

45. Finally, in the history of the individual, this movement sensation is felt also as the local value of the sensation with which it fuses.

46. In addition we must consider again that the central excitement is related not only to the sense impression but also to the open-

ness or closedness of the paths of motor discharge. Openness corresponds to vividness (28) closedness to inhibition (83-85). The characteristics of the sensory state depend upon the condition of the motor system. Every point in space by inborn dispositions for valuable reactions innervates a particular response. Development leads to the fusion of the optical, tactual and acoustical space values with one another. But we have only one space because we have only one system of reactions.

Time

47. In the perception of time certain mental states are found. These are to be analyzed and not associated questions, if we are to remain in the realm of introspective psychology. We can perceive only present time. It is this immediate awareness of time that we consider in the study of the perception of time. Sensations (54-74) given by our bodily reactions arise in any time interval, the object of awareness. These are sensations of tension and relaxation, similar to the movements in space perception. The special organs at work depend upon the individual. Ordinarily these sensations fuse with the tactual, acoustical or optical sensations but they can be differentiated and brought out, in the introspective experimental study. Anything which reduces these tensions shortens the time interval. It is, therefore, not the duration of a sensation which gives the time feeling but a special combination of sensations. Here come also the influences of the tension movements upon the sensory process itself. The discharge of the centrifugal system thus underlies the time perception also.

Meaning

48. Things have meaning for us when the sense impressions fuse with associations (75-78) which indicate their relations. And, as in the case of the other perceptions a unified reaction (79-82) is involved, so here, every new shade of meaning must vary the impulse to reaction. But, by development, the associations do not arise every time (83-85). The motor setting, the inner adjustment to the appropriate reaction, then becomes the meaning of the perception. We know meaning because we are prepared for an adjusted line of action. Kinesthetic sensations (70, 71) come in but the resetting of the motor system, itself, and its retroactive effect upon the sensory processes, is the fundamental condition. This resetting gives the impression its meaning.

49. The same object can have different meanings for different individuals because the lines of action vary in accordance with habitual associations.

50. Smoothness of reaction produces the feeling of familiarity.

51. Falsely adjusted setting produces illusions. The setting may be false owing to the influence of the emotions (18).

52. Thus in our perceptions, also, the four fundamental processes of stimulation, reaction, association and inhibition play their part.

53. We must now study the elementary processes themselves.

STIMULATION

54. We are not to study the physical process or to enquire what external processes have the power to stimulate the central nervous system. Those are questions for the physiologist. On the contrary, we are to study the impressions which we receive and try to discriminate all the noticeable differences. In other words, we are to study the mental content which results from such external stimulation. This content resolves itself by the aid of introspection in the psychological laboratory into mentally indivisible parts which are known as sensations. Their list is long, but very short when compared with the multitude of objects which we perceive. They can be compared to the letters of the alphabet whose combination forms the whole of language.

Optical Stimulation

55. Distance, direction, size and shape, and position are not elementary because they can be analyzed into simpler elements. So, we neglect the fact of pleasantness or unpleasantness or the attraction of the attention, in our light sensations. The simplest differentiation which we can make is that which separates the colors from the colorless light sensations. Then the colored lights can be divided into about one hundred and fifty recognizable shades. But these are felt as similar to four colors and every possible color impression gets its value through similarity to two of these four points. In the colorless light sensations we have only two points, the white and the black. So, in speaking only of the mental elements, we can rightly say that all the one hundred and fifty color differences result from the combination of the mental elements, red, yellow, green, and blue. The achromatic series demands the same interpretation. Every gray is a mixing and blending of the white sensation and the black sensation.

56. So, in the case of saturation and brightness, the impression appears to be simple and unified. But these tints and shades to which we apply the term "saturation" indicate an admixture of white or an admixture of black. Thus we have psychologically between thirty and forty thousand different color impressions which can be reduced to six fundamentals. Another reduction can be effected also. Black is darkness, the absence of light, while white is brightness. And this same series from greatest brightness to deepest darkness goes through the world of colors. The physical conditions for all these differences and the physiological laws governing them have been worked out in the sciences of physics, chemistry, anatomy and biology. We will not consider them here as we are interested only in the mental content.

Auditory Stimulation

57. In the field of sound sensation the biologist would ask to what sounds the organism reacts and he would judge the effectiveness of the stimuli from the behavior. But the psychologist analyzes the inner experience first. Later the inner experience may be correlated with the physical and the physiological process.

58. We differentiate first tones and noises. As elements of music they are only a psychophysical by-product. The real tones are the vowels and the noises are the consonants. Then we differentiate timbre, pitch and strength. From these factors come all the complex sound sensations.

59. In pitch nearly ten thousand steps may be discriminated by a good ear. But in this series certain steps fuse. This fusion is a mental experience also. The phenomenon of "beats" is another mental experience. On the other hand, the pleasure which results from the one and the roughness or loss of beautiful smoothness which results from the other, is not a characterization of the tones themselves but is an added mental experience (15-17).

60. Here again we are face to face with the action of a physical world upon an organism born to receive it only in this way.

The Lower Sense Stimulations

61. The world with which we are brought in contact by taste, smell and touch is concerned with our bodily interests only. Our intellect (21) is not stimulated by these in the way that it is by words which we read or hear. There is also a difference in the esthetic value (20) of the things imparted by these senses. These

sensations may be pleasant (15-17) but only the visual and auditory can be beautiful (20).

62. The number of distinct elementary taste sensations is very small. The ultimate factors are sweet, salt, sour and bitter. Each may be more or less intense. Alkaline and metallic are blends of taste and smell. The element of burning in salty taste and of contraction in sour taste are effects and not parts of the tastes, just as the pleasantness or the unpleasantness (15-17) are not real parts of the tastes. Oily, soft or pricking effects are also to be separated out as combinations.

63. Tastes can blend, fuse or neutralize one another to a certain degree. We can also become adapted to the stimulus. That is to say, if it continues long it fades.

64. Physiologically these mental contents are conditioned by the mechanism of the animal. In addition, it is the prevalence of certain taste papillæ in special regions which causes the characteristic motions of the face in tasting sweet and bitter substances, and these motions so betray the feeling tones (15-17) of the tastes that we can trace the effects in the emotional expressions (18) of the face.

The endless variety of perceptions from eating and drinking are combinations of smell, taste, touch, temperature and reaction movements.

65. In the case of the odors we can distinguish nine large groups with their subdivisions. Here also we have the phenomena of fusion, neutralization and adaptation.

66. In the case of touch we have only one quality, that of pressure in varying degrees of intensity. The manifoldness of the simple impression results from spatial variations and from location on certain parts of the body. Then smooth and rough, wet, dry and greasy are combinations, the result of the interrupting of tactual sensations and the addition of temperature sensations together with feelings of resistance. So also with light and heavy, we have skin pressure and pressure upon the deeper, inner organs combined with muscular effort.

67. Adaptation and contrast are also important in touch sensations.

68. We distinguish heat, cold and warm sensations. Heat is found to be a combination of cold and warm.

69. Pain sensations are also distinct but often fuse with pressure sensations. They are characterized by a tendency not to fade and by their long after-effects. The unpleasantness (15-17) which accompanies them is a separate thing from the pain.

Internal Stimulation

70. The sensory stimuli from within the body also influence the central and centrifugal processes as much as the messages from without. A fatigue sensation from our muscles, a hunger sensation from our stomach, a pain sensation from our head may have greater influence than sights and sounds. These sensations lack the manifoldness of sensations from the outside and they are less sharp and distinct in quality and local difference.

71. The psychologically most important of these are the sensations which result from the movements of the body. These are prominent in the perception of space (43-46) and time (47), in attention (28), in emotion (18), in the consciousness of the self (7-11) and in the will (24, 25). These sensations show two qualitative differences, those of movement and of tension. Intensity is different; a complex of tension, tactual and muscle sensations varying in space and time. In the tension sensation we can distinguish intensities. Tension sensation tells us the weight of an object. Movement sensation tells us spatial relations. Decrease of tension is felt as relaxation. Fatigue and pain also come from muscle action. The consciousness of head movements is secured by the semicircular canals.

72. The chief feeling sensations are pain and lust. These can be dissociated from the subjective disliking and liking (15-17) which accompany them practically. In addition, we also have sensations of bodily comfort or discomfort which are combinations with tactual and kinesthetic sensations. Hunger is another combination in which contractions of the stomach play a part. Thirst is a combination of tactual and kinesthetic sensations. Nausea and suffocation are others. Then there are tickling, relief from itching, satisfied appetite, refreshment from fatigue, and so on.

73. These are all conditioned by the physical make-up of the person and the state of the body at the moment.

74. It is the manifoldness of these stimuli and the greater manifoldness of their combinations which makes up the material of our mental personality.

ASSOCIATION

75. The next psychological element to be considered is association. On the mental side it is a question of the reawaking of earlier sensations. This is different from the direct after-image of certain peripheral processes notably light, and it is certainly not the perseverance of central excitement such as the continuation of a melody

over and over, of a feeling sensation or of a mood, or even a fixed idea. An associative reappearance must really enlarge the present impression. An impression awakes a characteristic feeling tone (15-17) by habit and in this way a response to a single stimulus may be the proper one for a total setting. This is association. And then, each reproduction in its turn may become a real central excitement and the starting point for new associations.

76. Association takes place only between impressions which have come together or in immediate succession, the so-called contiguity, or between groups of impressions which differ in some essential elements but which have sufficient elements in common to produce the feeling of similarity. We are here reminded of the mutual inhibition which is present in fusion.

77. Another peculiarity of the process is that a difference is felt between the present impression and the associated reappearance of the past. This is not a difference of intensity or of clearness; it is not more changing, more labile, more fleeting; it is not a difference of vividness (28).

78. The conditions of association are the recency, the frequency and the impressiveness (28) or the emotional importance (18) of the impression. Then there is the so-called constellation or context which is a combination of ideas (32-41) and impressions (54-74) demanding a particular result. The negative side of this demand, of course, is the inhibition of conflicting associations. This means that our associations are the starting points of actions (79-82) which must be considered now in order to understand the association process itself more fully.

REACTION

79. We can not be interested from the point of view of introspective psychology in the reaction process as it appears in the behavior. We can be interested only so far as the physical action concerns the psychical experience. We find that impressions (54-74) and associations (75-78) cause muscle contractions and that the sense effects of these actions are mental states which contribute much to conscious experience. Secondly, the outer effects of these actions are perceived and the ideas (32-41) of these effects become associated (75-78) with the central states (15-23) which led to the actions. The action of the organism thus appears to be of greater importance to the mental life than even the centripetal process. The modes of action preëstablished in the organism either work toward a continuation of the helpful thing or toward protection from

injury. The desirable is continued, the undesirable stopped. The same is true of attention (28). Of the same sort is the reaction to the associative reproduction (75-78) or memory (33-36) and still the same but more highly differentiated is the response to words as the symbolic presentation of sense experiences.

80. Repetition decreases the resistance in the motor paths, making the discharge habitual and giving the feeling of familiarity. In this way short cuts are made possible, with the resulting development of highly complex reaction systems.

81. Reactions are not only those of voluntary muscle but also include those of glands and smooth muscle. Some of these reactions occur with our habitual knowledge and some without and they may be produced not only by impressions (54-74) but by reproduced excitements (75-78) as well.

82. But the greatest meaning of all these reactions is not that they result from central excitements but that they are themselves the source of sensory stimulations. These are important in perceptions (42-52), in attention (28), in the perception of space and time, in the emotions (18), and they are the chief vehicle to carry associative connections (75-78) to the mind. By the association of the sensory effect of an action with the mental situation which leads automatically to an action an idea of the effect is produced and this raises the automatic to a will action (24-27).

INHIBITION

83. If every stimulation were admitted to the mind a chaos of impressions would result, and still greater confusion would take place if the associations had free play or the reactions were unchecked. As a matter of fact few impressions come at once, associations develop only in definite lines, reactions are orderly and well organized. The selecting principle at work is called technically "inhibition." One impression (54-74) may crowd out another; an inner excitement (18), an absorbing (28) thought (29-31), an emotional irritation (18) may act in the same way. The impression, thought or emotion which is crowded out loses its ordinary impressiveness, loses in vividness (28). There may be a mutual inhibition by which the impressiveness of each of several factors is decreased. Such a mutual inhibition is exhibited in the phenomenon of fusion. This fusion occurs in all our sensations and makes possible their uniting into perceptions. The cue to fusion and similarity lies in the attention value, the vividness (28). The suppression of associations is of the same sort.

84. From the foregoing it is apparent that the formula that controls this suppression is not a question of the number of elements nor is it a question of strength; it is one of impressiveness (18), vividness (28), distinctness. This is conditioned in the body by the mutual inhibition of antagonistic muscle groups which is so important in will action (24-26) and which is prepared in the nervous system.

85. This very motor antagonism will throw light on the seeming chaotic inhibitions in the sphere of the sensations (54-74) and ideas (32-41). The difficulty disappears if we consider the actions to which the impressions or ideas lead. The activity in the centrifugal paths has a backward influence on the sensory centers and so it comes about that the regulating condition for the reënforcement or suppression in the whole world of sensations and ideas is the preparedness and unpreparedness for action in the motor centers.

THE IMPLICATIONS

86. It must be apparent from the above analysis that there can be no further question for the introspective psychologist as to the possibility of the cerebral localization of function. In the direction adopted till now it is impossible. Such a thing as the localization of abstract concepts⁶ in the frontal lobes and of concrete concepts in the parietal lobes is as naïve as Gall's phrenology. That such a system of localization was probably a make-shift has long been suspected. Who, endowed with a logical judgment, could avoid the idea that the cortex must be somehow entirely sensory and motor (and possibly associational), in view of the fact that the whole peripheral and cord system is sensory and motor? Who could help feeling that the whole of the mental life must somehow be reduced to centripetal and centrifugal processes? Who could hope for anything but a worthless outcome for the problems of cerebral localization when we lacked a foundation in normal psychology? Psychopathology and psychiatry were built without it and look at the motley patchwork, a crazy-quilt to cover our ignorance, even as summarized in the last classification of the Medico-Psychological Association.⁷

87. But at last a normal psychology has been established on the firm foundations sensation, reaction, association and inhibition, defended by anatomical and physiological bulwarks.

⁶ Campbell, A. W., *Histological Studies on Cerebral Localization*, Proc. of the Royal Society, 1903.

⁷ *Statistical Manual for Institutions for the Insane*, Nat'l Com. for Mental Hygiene, New York, 1918.

88. If our psychology, so founded and so buttressed, is true, what must be the state of our nervous anatomy and physiology, as yet unknown, and are all the data discovered till now entirely true? Let us integrate them using the data of introspective psychology as the constant.

Sensation.

89. On the side of sensation we can add to our present knowledge that warm, cold and pain must have arrival platforms in the brain. Touch and kinesthetic sensibility have rapidly taken over the areas previously ascribed to concrete concepts. Perhaps warm and cold complete the conquest of that territory, perhaps pain. Possibly warm and cold or pain belong in the areas ascribed to abstract concepts. We must maintain at least that the areas for abstract and concrete concepts are no more and that their places are taken by things more mundane and less esthetic. The fact that pain points in the peripheral apparatus outnumber the warm and cold points by about ten to one should give us a clue as to the relative extent of the areas in the cortex but only experimental physiology can give us the exact location. Perhaps pain is in the frontal areas and warm and cold in the parietal areas since the frontal regions are so much larger than the unplotted parts of the parietal regions, than the so-called silent parts.

90. No additional information and no change can be deduced from introspective psychology as to the pathways in the cord and mid-brain.

Reaction

91. Reaction is seen to consist of four kinds, or perhaps better stated, it is seen to go in four directions. Action, commonly so-called, consists of flexor and extensor responses. Let us call this voluntary action, though it may be brought about involuntarily through the agency of the cord reflexes. Reaction, commonly taken to mean the involuntary processes, may then be called involuntary action and this is in two directions also. Either it is a contraction or a dilatation, an accelerator or a depressor effect, a secretory action or a secretory inhibition. Reaction then consists of voluntary action and involuntary action and each of these is in two directions.

92. The motor centers in the brain, mid-brain and spinal cord for voluntary action in either direction are well known. The centers for involuntary action are less well known but they exist in the ganglionic chain and in the thalamus at least.

93. Connections between the sensory arrival platforms and the cells of origin of the motor nerves are implied by the introspective psychology. These connections have long been postulated in the intercalary neurone of the spinal cord and doubtless they have been traced in the simpler animals but they have never been thought of seriously in that transcendental organ, the brain. Introspective psychology makes them the *sin qua non* in the brain as well. And with the admission of this idea the cellular stratification of the cerebral cortex becomes lucid for the first time. We must now assume that the cells of the sensory cortex throughout the brain are sensori-motor, that is, intercalary, in function. They are all cells of origin of neurones which connect the terminal arborizations of the axones of the sensory nerves with the dendrites of the motor nerves. The differences in size which give rise to the appearance of from three to eight strata are due to the fact that the cells give origin to longer or shorter axis cylinders, that is, they connect parts nearer or farther removed. They go out and connect with from three to eight levels of motor cells.

94. However, the same can not be said exactly of the sensory arrival platforms for the muscle and kinesthetic sensations. The action theory, which has become perhaps the most important contribution of the introspective method, makes us assume connections between the sensory arrival platforms of the muscle and kinesthetic sensations and the sensory arrival platforms of all the other senses. Hence, the stratification of the areas for these senses is due to differences in the length of neurones, as in the case of all nerve cells, but the cells in these areas give rise to fibers which connect the terminal arborizations of the axones of the nerve cells of muscle and kinesthetic senses with the dendrites of the cells of the sensory areas. They are the cell bodies of sensori-sensory neurones. Of course one layer in addition may go to the motor area lying just anterior, thus corresponding to the intercalary neurone in the spinal cord.

95. The consideration of the cerebral cortex then gives the following cytology. Motor areas consist of cells of origin of motor fibers. Sensory areas consist of cells of origin of sensori-motor fibers, with the exception of the areas for the reception of the muscle and kinesthetic sensations. Muscle sense areas and kinesthetic sense areas consist of cells of origin of sensori-sensory fibers, only one layer being sensori-motor, possibly.

96. Corresponding to this plan the myeloarchitectonic structure of the cerebral cortex may be taken to be as follows:

A. Motor areas consist of outgoing axones of the cells of those

areas and of the terminal arborizations of the axones of sensori-motor cells which lie in the sensory areas of the cortex.

B. Sensory areas with the exception of those for the muscle and kinesthetic sensations, consist of outgoing axones, of the sensori-motor cells of those areas and of the terminal arborizations of the axones of sensory cells which lie in the subcortical, tectal, pontine and spinal sensory nuclei. In addition, there come into these areas the terminal arborizations of the axones of sensori-sensory cells which lie in the muscle sense and in the kinesthetic sense areas.

C. Muscle sense and kinesthetic sense areas consist of the outgoing axones of the sensori-sensory cells of those area and of the terminal arborizations of the axones of the sensory cells of those senses. These are located in the spinal posterior root ganglia and corresponding ganglia for the cranial nerves and in the sensory nuclei for the muscle and kinesthetic senses in the medulla and possibly in the cerebellum.

97. It is especially remarkable that the muscle and kinesthetic sensations do not come into consciousness directly as such but only in their results. Without conscious sensation from our muscles, tendons and joints we know the position of these members in space. This fact suggests the idea that one layer of cells in the muscle sense and kinesthetic sense areas may send fibers to the motor areas also. That is to say, one layer in these areas is composed of cells of origin of sensori-motor neurones. But if only one motor level is reached from the areas of muscle sense and of kinesthetic sensations, then the other motor levels must be reached directly from the spinal sensory neurone. This seems to be the chief function of the intercalary neurone of the spinal cord and of corresponding elements at higher levels.

98. Another idea suggested by the fact that muscle sense and kinesthetic sense are not in consciousness while the other senses come to consciousness, is that the combination of the muscle and kinesthetic sense with the other senses is necessary for them to appear to be in consciousness. The muscle and kinesthetic senses are not in consciousness because they are not connected to themselves by pathways.

A comparison of the brain and lower segments of the central nervous system, including the spinal cord, shows only one essential difference. Both consist of or at least contain motor elements and sensory elements. Both contain intercalary or connecting elements between the two; in the spinal cord called the intercalary neurones, in the brain called the sensori-motor neurone. Both may be taken

to contain connections between them and the autonomic system. Certainly the connection is known to exist in the cord. The connection in the brain between it and the thalamus will be taken up in the next paragraph. The only essential difference between the two great parts of the central nervous system then consists in the addition in the cerebral segment of the sensori-sensory neurone. This is the essential thing which raises the brain to the dignity of the organ of consciousness and which gives it the peculiar place that it occupies in the human cosmogony.

Little can be gleaned from introspective psychology as to the connections between the cortex and the thalamus except that they must exist. It is certain that the perceptions, memories and the ideas can affect the emotions. This should make us suppose an anatomical connection between the cortex and the thalamus but it is difficult to say whether that connection is from each sensory area or only from the areas of muscle and kinesthetic sensibility. In other words are our emotions stirred directly by the sensations or is it the meaning of our perception, our memory or our idea which stirs us? If "meaning" is essential then the connection is only from the latter centers for we have seen that the perception of meaning is a function of the reaction apparatus.

We also know that the emotions in their turn influence the perceptions, the memories and the ideas, and so on. It is still more difficult to say what the connection is in this case. It is possible that there are direct anatomical connections from the thalamus to the cortex. On the other hand, it is perhaps equally possible that the thalamus affects the cortex by disturbing the equilibrium in the vaso-motor and glandular apparatus so that the connection is physico-chemical rather than anatomical. It may be both. Certainly, if we are to compare the state of affairs in the brain with that in the cord we must suppose anatomical connections in both directions just as there are in the lower levels between the cord and the autonomic system. However, the question can not be settled by the introspective method as yet.

Inhibition

99. The data of inhibition can add no more to our ideas of cortical structure. The same paths are used as in the reaction process but we not only must see that the production of either set of actions inhibits the opposites but we must also realize that voluntary action may be completely inhibited and involuntary action may be allowed full play. This is the case in the assumption of the esthetic attitude.

Association.

100. To the associationist the above scheme of things must seem rather incomplete. Where are the association fibers? The greatest implication of the introspective psychology is just this. There are no association fibers in the ordinary sense of the term "association."

101. Let us reconsider association. We have seen that on the mental side it is a question of the reawaking of earlier sensations. This reawaking may be brought about by direct stimulation of the same paths previously excited or indirectly by the awaking of the characteristic feeling-tone. The direct stimulation of the same paths does not require that all the same paths be stimulated in the reproduced perception. If sufficient of them are stimulated to produce the same reaction with its characteristic feeling from the muscle and kinesthetic sense areas, the result is reached. Such an association is spoken of as an association by similarity. This certainly does not require paths between the cortical centers for the various sensations such as are generally assumed to exist.

102. Association takes place between impressions which have come together or in immediate succession to the consciousness. This is called association by contiguity. This is a matter of a time relation. This does not demand paths between sensory centers.

103. Association takes place between similar impressions. Similarity is produced as shown in paragraph 101 and also when groups of impression differ in some essential elements and yet have sufficient elements in common to produce the same actions, voluntary and involuntary, with the resulting muscle and kinesthetic sensations or feeling-tones and emotional alterations. This does not require paths between sensory centers but only between sensory and motor centers, between muscle sense and kinesthetic sense areas and the other sensory areas and between sensory areas and the emotional centers, the vascular-glandular centers.

104. The fact that emotional disturbances can also call up ideas suggests that there are also pathways from the vascular-glandular centers to the various sense areas in the cortex. It is a question whether such pathways exist in the sense of nerve tracts. It seems more likely that the effect of the activity of these centers reaches the cortex through the warm, cold and touch nerves which are stimulated by the vascular and glandular changes in the skin and membranes and by the alterations in the chemical equilibrium of the body fluids produced by the glands of internal secretion which act in conjunction with these vascular-glandular centers.

105. Another peculiarity of the association process is that a difference is felt between a present impression and the associated reproduction of the past. This does not demand pathways between sensory centers. This is a matter of relative time values which are given by the actions, voluntary and involuntary; that is to say, by the muscle sense and kinesthetic senses and the sensations associated with the feeling-tones and the emotions.

106. The conditions of association are the recency, frequency, attention value or impressiveness and the emotional importance. The first two are matters of time and hence do not demand tracts. The attention value is muscular, the emotional value only demands paths between sensory and vascular-glandular centers.

107. Constellation and context refer to settings in the motor paths demanding a particular result. Any given "particular result" must necessarily excite the muscle sense areas, kinesthetic sense areas or the emotional centers. But none of them demand connections of a direct sort between sensory centers.

108. From the above laws and peculiarities of the association process it is apparent that an anatomical connection directly between all sensory centers is unnecessary. Such connections would be superfluous. They are excluded for they are not implied by the introspective psychology.

109. Smaller psychical elements than the sensation are also unnecessary for both the community of parts in similarity and the mutual inhibition of parts in fusion are accounted for by the reaction process, including inhibition, whose pathways have already been delineated above without the use of association fibers.

110. The present idea of association tracts is an anatomy based upon philosophy, not even upon psychology. The theory of the association of ideas is as old as Plato and modern investigations in this field have added little of real importance to his work. Anatomically the brain can be split along certain rough planes after proper hardening. Histologically tracts of myelinated fibers can be shown to lie in these planes of cleavage. But even in the simplest mammals as studied by Cajal⁸ no fibers have been directly traced from one sensory center to another. The appearance has been noted, the theories of association have been studied and forthwith the conclusion has been reached that these tracts are association tracts.

111. An anatomy based upon introspective psychology provides no association tracts in the ordinary sense of the term but it satisfies

⁸ Cajal, S. Ramon, *Système Nerveux* (2 vols.). A. Maloine, Paris, 1909.

all the laws of association and all the known facts of anatomy. Association is a philosophical conception, not an anatomical one. This conception of association is born out by the history and the known laws of association and by introspective psychology and the anatomy deduced from introspective psychology is comprehensive enough to satisfy the philosophical and psychological conceptions of association without providing association pathways in the ordinary sense.

112. No known anatomical facts conflict with this conception of association, that is to say, that association is a philosophical and psychological conception and not an anatomical one.

113. What then are the components of the so-called association tracts if they are not association fibers? Let us begin with the long tracts.

114. The cingulum is that tract which arches above the corpus callosum from the frontal lobes to the uncus. At first thought to link these lobes together, it is now considered to be composed of shorter and longer fibers, none of which extend its entire length. Considered with the data of introspective psychology in mind, we must take it to be composed of sensori-motor fibers and sensori-sensory fibers. The sensori-motor fibers composing it would then be:

<i>Anatomically</i>	<i>Physiologically</i>
Uncino-precentral	Olfactory-motor
Occipito-precentral	Visuo-motor
Parieto-precentral	Estheto-motor (? calorico-motor)
Postcentral-precentral	Musculo- and kinestheto-motor
Fronto-precentral	? Algesio-motor
? -precentral	Gustato-motor

The sensori-vascular-glandular fibers, if they exist, should be considered with the sensori-motor fibers. As components of the so-called association tracts with particular reference to the cingulum they would be:

<i>Anatomically</i>	<i>Physiologically</i>
Uncino-thalamic	Olfactory-affective
Occipito-thalamic	Visuo-affective
Parieto-thalamic	Estheto-affective (? calorico-affective)
Postcentral-thalamic	Musculo- and kinestheto-affective
Fronto-thalamic	? Algesio-affective
? -thalamic	Gustato-affective

The sensori-sensory fibers in the cingulum should be:

<i>Anatomically</i>	<i>Physiologically</i>
Postcentral-uncinate	Musculo- and kinestheto-olfactory
Postcentral-occipital	Musculo- and kinestheto-visual
Postcentral-parietal	Musculo- and kinestheto-esthetic (? calorico)
Postcentral-frontal	Musculo- and kinestheto- ? algesic
Postcentral- ?	Musculo- and kinestheto-gustatory

115. In the same way the uncinate fasciculus may be supposed to consist of the same sort of fibers but in this case coming only from the temporal and frontal lobes, lower parts and gyri recti, to the precentral convolutions and the thalamus and returning to the temporal and frontal lobes from the postcentral convolutions.

116. The superior longitudinal fasciculus may be taken to be composed of the same sort of fibers from other parts of the temporal, occipital, parietal and frontal lobes. The inferior longitudinal fasciculus then is composed of the same sorts of fibers from the occipital and temporal regions to still other parts of the precentral convolutions and thalamus and back from the postcentral convolutions.

117. It can easily be understood how the thousands of intercrossing fibers in these regions might very readily lead to easy fracture along certain more or less well-defined planes upon proper fixation, might give the appearance of definite tracts with the myelin stains and yet be composed of longer and shorter fibers of very different function. Histology and the rough methods of gross anatomy have shown all but the "very different function" and this is one of the implications of the introspective psychology.

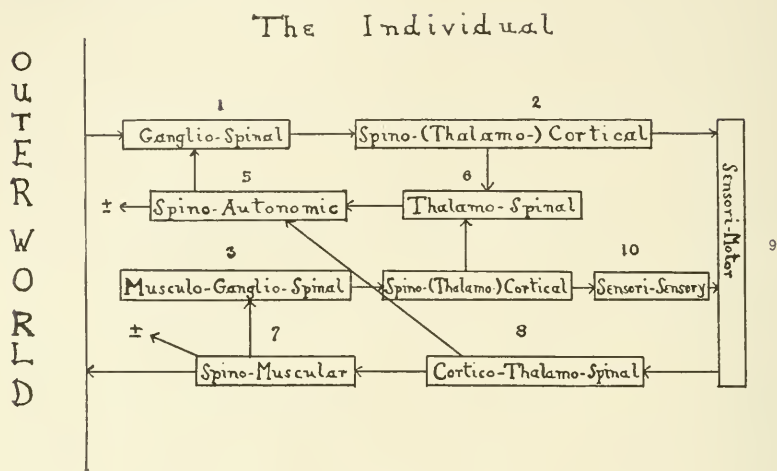
118. The shorter tracts may be taken to be of the same sort but their appearance is due to the early crossing as the fibers emerge from the gyri to cross at the bottom of the sulci and corresponding to this, their composition must be simpler. They have not gone far enough to mix with the profusion of fibers from other regions. This is reserved for them as they proceed in their course to join the long tracts.

119. The commissural fibers of the corpus callosum, anterior commissure, hippocampal commissure and so on, are probably of the same sort but from the opposite side of the brain.

120. Thus we may finally deduce a standard scheme for the nervous system which should suit all the anatomical facts and explain all the psychological facts. Such a scheme is the final anatomical implication of the introspective psychology.

121. For one who is familiar with cerebral anatomy the scheme will fill all the data without explanation. The ganglio-spinal, cortico-spinal and spino-muscular pathways are fairly well known. The spino-thalamo-cortical, cortico-thalamic, thalamo-spinal and autonomic systems are not so well known. The sensorimotor and sensori-sensory systems are implied by introspective psychology and have long been known anatomically but they have been

called association tracts under the hypnotic suggestion of associational philosophy and psychology.



122. Let us see how far the scheme fits our psychological knowledge. What parts of the system are involved in the psychological complexes? Beginning with the simplest psychological complex, the simple perception, we have the simultaneous excitement of various sensations bound into a unit by our reaction. The sensations are carried by S, the reactions by M. The perception of space, of time or of meaning is also given by the reaction, provided for in the M side of the line. The sensations themselves come to the conscious level in the sensori-motor neurone. This does not mean that the sensori-motor neurone is the seat of consciousness. The sensations do not stand isolated in consciousness in practical experience but they are only the ultimate objects of awareness for this introspecting subject. Practically they stand in combination with the rest of the conscious personality and we have seen that such consciousness is probably a function of the reaction mechanisms. But the sensation as the final object of awareness for the introspecting consciousness probably resides in the sensori-motor neurone.

123. Ideas renew previous perceptions and hence involve the same paths. The time elements in memory ideas, present perception and expectation as well as in imagination and general ideas are given over the paths concerned in the time sense (M). But memory is controlled by reality and so is controlled by the outer world, thus involving paths exclusive of the affective ones while imagination involves the affective paths. General ideas involve all the paths

depending on their nature and the nature of the previous perceptions of which they are compounded but they finally discharge through the motor pathways (M) with the results common to all discharges by these pathways.

124. In every will action there is an idea of the end. This idea of the end does not differ from other ideas and naturally the discharge is over the motor pathways. Attention also has an end in view which is fulfilled through the motor and affective pathways by the shifting of the ideas. Thinking itself involves no new pathways for it is essentially only a prolonged attention process. The attitude, if motor, gives the practical shading of intellectual thought and if vascular-glandular, gives the affective, emotional shading of imaginative thought.

125. The simple feelings are originally automatic and are given by the centrifugal processes (M) and their results. The emotions are vasomotor-glandular and the discharge thus affects the entire economy, causing metabolic changes, while the vasomotor changes also reach the sensorium again by the warm, cold and touch fibers which are stimulated in flushing, blanching, the pouring out of "cold sweat" and so on. In the diagram the former is taken account of by the \pm symbol which signifies that alterations are brought about in the equilibrium rather than that direct sensory or motor discharges are produced, in the ordinary sense.

126. The attitudes, being given by reaction and inhibition, involve no new paths either. And so the whole personality with its multitudinous interplay can be explained on the single scheme outlined above.

127. One can not close without a few words on the possibility of the creation of a rational system of psychoanalysis based upon the above psychology and anatomy. And from such a system of psychoanalysis should arise a system of cerebral localization which should be accurate and by which the localizations should be effected from the productions of the patients.

128. Such a system, like its sponsor, the introspective psychology, would be opposed to the interpretative, emotional system and like its sponsor should expect the same opposition that has already been accorded the interpretative psychology by the causal type of thinker.

FINIS

Note.—A great deal of credit for inspiration and courage is due to the patience of Aenne Josephine Cohen, M.A., who ably assisted in the discussion and consideration of the various angles of this study.

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EPILEPTIC SEIZURES, TRANSIENT HEMIPLEGIAS AND TEMPORARY PAPILLEDEMA IN A CASE OF DOUBTFUL ETIOLOGY

(From the Neurological Service of Bellevue Hospital)

BY THOMAS K. DAVIS, M.D.

NEW YORK

CASE.—L. W., housewife, aged twenty-eight, American born, one of eight children; of these, all living but two. One sister died in infancy, and one brother at the age of fifteen. In the mother's family there is a history of tuberculosis. In school, the patient finished the seventh or eighth grade and is said to have made normal progress. At sixteen, she had middle ear abscesses; at twenty-two a rectal abscess. The menses began late, between sixteen and seventeen, and dysmenorrhea has been prominent. She married a year and a half ago and had a child which died at five months.

The feature of the past history which concerns us most is that at the age of eleven, she began having epileptic attacks, general in character, but ushered in by focal right-sided symptoms. These attacks first occurred three and four times daily, and have continued up to the present time. Even recently, before admission to the hospital, she has had as many as three in one day. At the age of twenty, in connection with a protracted illness, she is said to have had 150 attacks in twenty-four hours, and a diagnosis of status epilepticus was made. Usually, an attack begins with a jumping of the right arm or right leg. This continues for a few moments. She then loses consciousness, and remains unconscious for five or ten minutes, with general convulsive phenomena. As consciousness returns, there is a feeling of stiffness along the right side. Then she sleeps for an hour, and has a headache on awakening. In many attacks she is incontinent and bites her tongue. Probably the most important point regarding the attacks is that she has repeatedly had temporary weakness of the right side, brought on by an attack, and sometimes lasting four or five days, after an especially severe attack. On March, 1920, she was brought to Bellevue Hospital. The note was made "Patient not acutely ill, but evidently much agitated and cries easily." On admission, her temperature was 99°, pulse 76, respiration 20, but even this extremely small rise in temperature was absent on the day after admission.

The following findings appeared on examination at that time:

Cranial Nerves.—I. Possibly defective sense of smell, right side.

II. Visual acuity and fields roughly normal, fundi negative.

III, IV, and VI. Normal ocular movements; pupils reactive and equal; no nystagmus.

V. Hypesthesia of right side of face, with both corneæ less sensitive than normal; motor root intact.

VII. Innervation of right side of face defective; supranuclear type.

VIII. Hearing defective on both sides: Later evidence obtained of chronic otitis media.

IX, X, XI, and XII. Normal.

Motor.—There was weakness of the right arm, evidenced in hand grasp and extensor and flexor movements of forearm; no ataxia; definite weakness in the right leg.

Sensory.—Over the entire right side of the body there was a hypesthesia to light touch and pin prick.

Reflexes.—The deep reflexes in the arm and also in the leg on the right side were increased and greater than on the left. In the upper extremity positive Hoffman sign. In the lower, while the Babinski was not positive, plantar stimulation on the right gave a less definite response than on the left. No superficial reflexes were elicited on either side. Normal organic reflexes. The gastrointestinal, genitourinary, and cardiorespiratory systems negative. However, the blood pressure was only 90 systolic, and 50 diastolic; several days later, still only 100; subsequent readings 90, 98; another day 80 systolic.

The urine showed a specific gravity of 1020, and was negative for albumin, sugar, and casts. Phenolsulphonephthalein output 30 per cent. in two hours; nonprotein nitrogen in blood, 48 mgs. per 100 c.c.; blood sugar 115 mgs. per 100 c.c.; carbon dioxide content 52 per cent. The spinal fluid taken three days after admission showed two cells to the cubic mm., normal globulin content; colloidal gold test entirely zero; negative Wassermann; Wassermann in the blood also negative.

It was felt that the patient presented a straight case of epilepsy, and that the case offered no particular difficulties, but on the tenth day in the hospital, she awoke one morning with a very severe hemiplegic condition of the right side. The hemiplegia included deviation of the tongue to the right; the uvula was turned to the left. She could neither lift up the right shoulder, nor move the right arm. The right leg was very weak. There had developed a definitely positive Babinski on the right side and there was astereognosis in the right hand. In addition, she showed what was considered a partial motor aphasia by those who saw her at that time. Unfortunately, this aphasia was not fully studied. It was present hardly more than two days. On the day that these hemiplegic symptoms developed, the fundi were considered normal. How-

ever, forty-eight hours afterward, a papilledema was found on the right, and a blurring of the disc on the left. This incidentally was paradoxical; the greater changes would have been expected on the left. These facts appeared to mean that, after all, we had been dealing with a neoplasm, and that hemorrhage had occurred into it, and this conclusion might have been held to, except for the fact that the papilledema did not continue. On March 25th, twelve days later, the following note was made: "Fundi and vessels tortuous on right, but blurring is confined to the nasal side. Left practically normal." There was rapid return of motor function of the right side, and just a month after the onset of the hemiplegia, she was walking very well without support, and using the arm.

We should make a point of mentioning that, apart from the papilledema, she had no ocular symptoms. She showed no somnolence and was afebrile. (Later, in connection with a tonsillitis, she showed a temperature of 102° , present only for one day.)

Some endocrine features need to be mentioned. Besides the history of dysmenorrhea and low blood pressure which have been mentioned, there is an abnormal pigmentation of the face, chiefly the forehead. There is slight maxillary prognathism. Both central and lateral right incisors have had to be replaced by artificial teeth; the left lateral has been filled. She frequently has a well-marked white line. The dysmenorrhea and dental findings should probably be bracketed. Such endocrine disturbances as they manifest are presumably gonadal, but the abnormal pigmentation, the white line, and the low blood pressure evidences suprarenal deficiency, and I believe that suprarenal deficiency may explain some of the difficult features of the picture.

Mentally, there are certain features of an epileptic mentality, in which deterioration is not lacking. There is a childlike lack of complete grasp of the significance of her condition, and, on the other hand hyperirritability when crossed in any small detail. There are no delusional trends; no torpidity; rather a considerable alertness. Her mental defects bring in a sloppiness of mentality as well as a real dropping out of the powers of accomplishment. I believe she shows the epileptic voice. Her tested mental age is only ten years.

Before taking up the discussion of the diagnosis, we should report that no evidence of ethmoid sinus infection was found to explain the papilledema. Unfortunately, the sinuses were not examined during the time that the fundi changes were most intense but blurring remained at the time it was done, and this fact, plus the

absence of any fever, is, I think, conclusive evidence that a sinus infection does not explain that feature of the case.

The sella turcica was radiographed, and the report is as follows: "Floor of sella is regular, but depressed in its posterior half. There is a suggestion of erosion of anterior surface of dorsum sellæ." This x ray also showed that the accessory sinuses were small, but otherwise not remarkable. At the present time the patient shows only the residuals of the hemiplegia, with slight paresis of the right side. This features varies, for instance, six days ago the positive Babinski returned following a fainting attack. As regards sensation, she has continued to show a right hypesthesia; in fact, to cotton touch, there is anesthesia of the right side. Differences between hot and cold tubes are clearly understood. The pain sense is partially affected. The Babinski which was present six days ago did not remain. Now, again, there are exaggerated reflexes on the right, but no pathological reflexes. In fact, after two months in the hospital she has returned to almost the precise condition as on admission, having in the meantime passed through a complete hemiplegic state, with undoubted evidence of organic basis, accompanied by temporary aphasia and temporary papilledema. How are we to interpret these signs and this unusual course?

Briefly, let us consider the possibilities as they seem to present themselves. To do this, one needs to keep in mind the chief features, namely, the attacks which have been present since the age of eleven, and secondly, the papilledema seen in the hospital. We will begin by excluding syphilis by the negative serology. The attacks have been so typical of epilepsy that a diagnosis of idiopathic epilepsy seems justified. The history of rightsided weakness lasting many days after attacks is not against that diagnosis, nor is the severe hemiplegic condition which made its appearance in the hospital, and which was not permanent. She has begun to show the mental features of a long standing epileptic. It is the papilledema which is not accounted for on the basis of idiopathic epilepsy as usually thought of. Even though the development of this papilledema at first makes one turn to the diagnosis of neoplasm, as the explanation, it is the transitory character of the papilledema which seems to exclude that diagnosis. There remains as a possibility a neoplasm of a cystic type permitting large fluctuations in size and pressure. However, none of the published cases of brain cyst which I have been able to discover mention a temporary papilledema as a finding. The first question, however, is of neoplasm and

I do not think that that possibility can be entirely dropped. Tuberous sclerosis first described by Bourneville is characterized by idiocy, epilepsy, multiple tumours of the brain and skin, also of the kidneys and heart and various so-called stigmata of degeneration. One should think of tuberous sclerosis in this patient inasmuch as it has been shown to be the occasional etiology of unusual epilepsies.¹ The intellectual capacity of the patient even though it is impaired does not reach the idiocy which is typically a feature of tuberous sclerosis. But much more conclusive evidence against this patient's presenting tuberous sclerosis rests on the fact that she lacks altogether the sebaceous adenoma of the skin. In a condition known to affect two ectodermal parts (skin and central nervous system) simultaneously, the skin changes of the typical adenomatous variety become the chief support for the clinical diagnosis. Indeed, are we not entirely prevented from making the diagnosis of tuberous sclerosis in their absence? Therefore, to eliminate that as a possible diagnosis and to put aside the possibility of neoplasm for the sake of discussion let us instead think of the patient as showing idiopathic epilepsy and try to explain the papilledema separately and yet in a manner not in conflict with the conception of idiopathic epilepsy.

1. Ethmoid sinus infection we can exclude by the absence of fever, and by the negative findings of the nose and throat consultants whom we have quoted.

2. Nephritis. The phenolsulphonephthalein test is low, thirty per cent., but the non-protein nitrogen in the blood is only at the limit of normal, 48 mgs. The patient has not shown edema and other signs of an acute nephritis, and does not have the high tension cardiac changes of a severe and chronic nephritis. Briefly, while the laboratory findings may indicate a certain nephritic factor, the condition is too near the normal to fully explain this clinical situation.

3. Epidemic encephalitis. Still presuming that we have an individual with idiopathic epilepsy, did an acute encephalitis account for this last more severe hemiplegia, and at the same time cause aphasia and papilledema. The points against this are that she had no somnolence, no ocular palsies, and no fever. Also do we not have to ask ourselves whether she has not had encephalitis every time that she has had hemiplegic changes in the past? Personally, I think we would be very slack to let such a case slip into that roomy category.

4. Focal changes in the pituitary gland causing temporary pres-

sure on the third ventricle, with resultant swelling of the optic nerve heads. I have already pointed out the evidence of suprarenal deficiency, and such a suprarenal condition would have to be considered the cause of the swelling of the pituitary gland, as a compensatory phenomenon. Such a relationship between the suprarenal and the pituitary is thought to exist. Whether to suppose that in an acute phase of suprarenal deficiency, a temporarily swollen pituitary would develop of an extent to cause so marked a papilledema, I am not prepared to say. I simply mention it as a possibility. To explain such a papilledema there is no theory which does not deserve at least to be brought to mind. If that aspect of the endocrine situation may explain the papilledema, the suprarenal deficiency may explain the temporary hemiplegias, and even be the cause of the epileptic attacks themselves. Localized focal cerebral anemias are here to be considered. That control of the blood supply of the brain is in part direct and vasomotor is stated by Burton Opitz, who accepts the work of C. J. Wiggers.² This is contrary to the older belief that it depended in a secondary way upon blood flow to the skin and viscera. Difficult questions come in here; for instance, implied focal vasomotor constriction in a clinical situation of low suprarenal secretion. I do not wish to take the time or to grow as theoretical as one would need to in a discussion of these theories. It all comes down to trying to explain why in so-called idiopathic epileptics hemiplegia develops which lasts for days. I do not think we know the explanation, and I do not think that Hughlings Jackson's theory of fatigue (cerebral) applies to cases where the hemiplegia lasts days instead of hours. Does this patient who presumably shows idiopathic epilepsy, and who has low blood pressure, offer any light on the question?

In conclusion, our case seems to be one of idiopathic epilepsy occurring in an individual with numerous endocrine symptoms and signs. I would raise the question whether these endocrine factors explain the epilepsy, as well as the motor phenomena occurring with it. I would even raise the question whether the endocrine situation provoked the compensatory swelling of the pituitary, as the cause of the papilledema. I raise these questions while admitting that we have not been able to exclude absolutely the question of neoplasm.

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Society Proceedings

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MEETING, MAY 20, 1920

E. W. TAYLOR, M.D., in the Chair

REFLEX PHENOMENA IN THE CONTRACTURE STAGE OF PERIPHERAL FACIAL PARALYSIS

DR. A. MYERSON: Following the acute phase of peripheral facial paralysis, of whatever origin, there is in the cases that partly recover a phase of contracture. In this phase, which comes on gradually after six months or more, the patient superficially presents a picture quite the reverse of the acute phase in that the nasolabial fold on the affected side is the more prominent and the aperture of the eye is more narrow on this side. There is usually some weakness of the face, with prominent, so-called associated movements, so that when the affected eye is closed the corner of the mouth moves with it.

The new phenomena described (illustrated on a patient) are (1) when an electrode (either G. or F.) is placed on the affected brow and the current turned on the corner of the mouth twitches even before the brow contracts and even though the direct excitability of the nerve is lessened. (2) Tapping the forehead or the bridge of the nose causes a contracture (reflex) of the affected corner of the mouth. These phenomena are absent on the sound side and in all other conditions. They seem to be specific to the contracture phase of peripheral facial paralysis and relate to changes in the nucleus whereby excitability is increased and made diffuse.

THE DIFFERENTIAL DIAGNOSIS OF HYPERTHYROIDISM

DR. J. H. MEANS: Overactivity of the thyroid gland is of interest to the neurologist not only because of the numerous clinical nervous manifestations to which it gives rise but also from the point of view of functional pathology.

The work of Cannon and his collaborators has clearly shown an intimate relationship between the thyroid gland and the sympathetic nervous system, also between the adrenal and the thyroid. Secretory

activity of the latter can be shown to occur if the sympathetic nerve is stimulated or if adrenalin is injected, and augmentation of the pressor action of adrenalin also takes place upon sympathetic stimulation. Furthermore, a condition in many respects like exophthalmic goitre was produced in cats, by the anastomosis of the phrenic with the cervical sympathetic nerve.

The work of L. B. Wilson is also interesting in this connection. This investigator found in the cervical sympathetic ganglia, which had been removed from patients with exophthalmic goiter, definite lesions of the ganglion cells which he regarded as causally related to the morbid process in the thyroid.

The fully developed case of Graves' Disease presents no difficulties in the matter of diagnosis. The neurologist, however, is frequently confronted with patients presenting atypical or suggestive symptoms of hyperthyroidism which he may experience difficulty in interpreting. The differential diagnosis of the milder grades of hyperthyroidism may be no easy matter. As a rule the differential diagnosis will be from various psychoneuroses, cardiac neuroses, effort syndrome, etc. and from early tuberculosis.

Of late years certain rather technical laboratory tests have been helpful in differentiating true hyperthyroidism from other types of disorder. Probably the most useful of these is the determination of the so-called basal metabolism. One of the chief functions of the thyroid gland is to preside over the rate of heat production of the animal body. An increase in heat production occurs in hyper- and a decrease in hypothyroidism. The determination of the combustion level therefore, serves as a function test of the thyroid. As such it is useful not only in estimating the relative degree of hyperthyroidism in a case of Graves' Disease but serves as a means of differential diagnosis in borderline cases, the metabolism being elevated in true hyperthyroidism and not in the other disturbances with which hyperthyroidism may be confused.

The level of the heat production or basal metabolism can now be easily determined in the clinic by means of respiration apparatus by the method of so-called indirect calorimetry.

The reaction to adrenalin has also been used to detect the presence of hyperthyroidism. It is undoubtedly positive in all cases of true hyperthyroidism but, as Peabody has recently shown, is also positive in such conditions as effort syndrome. It is therefore less reliable than the determination of the metabolism level as a diagnostic procedure.

The blood sugar curve has also been suggested. Aub and Davis however, have shown that while an alimentary hyperglycemia is readily produced in hyperthyroid patients, the height of the curve bears little relationship to the intensity of the thyrotoxicosis.

In general we must regard these special tests as helpful but must, as in everything else, put the information gained by our five senses first. Nothing can supplant the importance of the clinical impression, but the

special tests, as Dr. F. C. Shattuck has said, if we make them our slaves and not our masters, will be of distinct aid.

(The clinical records and charts of three patients which illustrated the value of metabolism studies both in differential diagnosis and in following the progress of Graves' Disease were then presented.)

CARDIAC NEUROSES

DR. PAUL D. WHITE: Cardiac neuroses are functional disorders of the nervous system attended primarily by cardiac symptoms. This subject is as old as the study of medicine itself; Hippocrates, Galen, and nearly all the other ancient masters wrote of it. It becomes obscured now and again and constantly needs reëmphasis.

The recent war revealed the fact that the irritable heart of soldiers is of very frequent occurrence. It is essentially a neurosis of the fatigue or anxiety type and should not be considered heart disease. The frequency of its occurrence in the army was such that my attention has been called since the war to its frequency in civilian life also, particularly among young women. It seems that nearly one third of all the so-called cardiac patients under forty years of age whom I am seeing now belong in this large group of cardiac neurotics. Obviously therefore, the subject is very important.

The differential diagnosis of cardiac neurosis includes consideration of true heart disease, hyperthyroidism, low grade infections like tuberculosis, and convalescence. A working classification built on that of the psychoneuroses presented to me by Dr. Stanley Cobb is as follows:

- | | |
|----------------------------|--|
| 95 per cent.
all cases. | <ol style="list-style-type: none"> 1. Fatigue neurosis—so-called neurasthenia. 2. Introspection neurosis—so-called hypochondria. 3. Anxiety neurosis. 4. Substitution neurosis—so-called hysteria. 5. Obsession neurosis—so-called psychasthenia. |
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DISCUSSION

DR. MORTON PRINCE: I should like to ask Dr. White if he found any enlargement of the heart accompanying his cases of cardiac neurosis?

DR. PAUL D. WHITE: The patients who have cardiac neurosis pure and simple have no enlargement and no murmur. There is no sign of actual heart disease in any case of true uncomplicated cardiac neurosis.

DR. MORTON PRINCE: The reason I ask the question is that there is a class of case which, although belonging to a different category, seems to have some bearing on these cases. I examined, under the Civil Service, applicants for the Boston Police and Fire Departments for a great many years, and in this way have examined the hearts of many thousands of men in the prime of life. During the early years of my examinations I was very much bothered by finding that many of these

men exhibited not only increased heart action (sometimes irregular) but an enlargement of the heart as well. In a good many cases mitral systolic murmurs were present. With such findings I at one time regarded these cases as slight forms of heart disease and rejected them therefore. But I soon began to have doubts regarding the nature of the manifestations and called in some of my colleagues to confirm my findings. The late Dr. John H. McCollom, who was at that time making similar examinations for the Police Department, made a series of observations and confirmed my findings. We were all very much puzzled and could not account for the cardiac symptoms since the percentage was too high to be accounted for by true disease. Accordingly I made a long series of investigations on several hundred men with the result, as was demonstrated, that the cardiac symptoms were due to emotion—the emotional excitement attending the examination. It so happened that the conditions of the examinations were such as to awaken considerable anxiety in the men examined. It became plainly evident that the enlargement of the heart, when present, was only the normal physiological dilatation that occurs under excessive stimulation to enable the heart to do the work which it is called upon to perform. In these cases the excessive stimulation was due to emotional excitement. In some cases the dilatation was so extreme as to permit some mitral valve leakage, thus causing the murmurs.

As a control experiment a series of examinations was conducted under conditions where the emotional excitement was eliminated. Under these conditions the previously observed cardiac symptoms disappeared. In another series of observations the anxiety was artificially stimulated as much as possible; in this series the symptoms were even more frequent. These observations were published in the *Medical Record* and the *Transactions of the Association of American Physicians*.

It should be borne in mind that at the time these observations were made it was the generally accepted idea that the heart was of a fixed size and did not expand according to the work to be done. I think these were amongst the first clinical observations, following the physiological experiments of Adami on dogs, indicating that the heart expands and contracts according to the work to be done and that this occurs under nervous stimulation. The disturbances that I observed, of course, were only of a temporary nature, but they are comparable to those observed in an anxiety neurosis of a chronic character. They might be called acute anxiety neurosis. They are in principle what used to be called irritable heart when the emotional factor was overlooked. They should be considered not as the manifestations of an abnormal heart but the normal physiological cardiac expression of abnormal anxiety. What is pathological is the anxiety and not the cardiac manifestations. In my long and checkered career I have also examined in connection with the granting of pensions, a great many thousands of the old soldiers of the Civil War in whom, as I remember it, there had been a diagnosis of

soldier's heart or irritable heart, but a good many years after the Civil War, even as late as 1884, many of these soldiers, as I remember it, still showed nervous disturbances of the heart.

DR. A. MYERSON: I should like to ask Dr. Means if in non toxic goitres the metabolism varies. Dr. White brought up the point that cardiac neuroses are found in young people. Why are they not found in older people? Do such cases die and if they don't spontaneously recover how do they get well? Reassurance in my experience has very little value. Does the condition disappear with early adult life and what is the mechanism of recovery?

DR. WALTER B. SWIFT: A word ought to be said about the speech in cases of goitre. Medical men are generally blind to neuropathology, I am told. To the subject of speech disorder they offer a deaf ear and a feeble mind, hence the need of this word.

I know but little about goitre itself. One of my first cases I saw in a Berlin Clinic where it was offered in an examination for my appointment as assistant. I made the diagnosis of neurasthenia, and was shortly appointed as assistant. Later I saw quite a number of cases in a goitre zone in Switzerland. In 1918, while giving instruction in Cleveland, Ohio, I discovered a goitre zone there and immediately established a goitre speech clinic which attracted thirty cases. Each one of these cases was put through a series of some forty speech tests, making in all something over 1200 speech tests with tabulation of data upon each. I am not ready to give full details of this paper because it was compiled in association with another, my former student, Miss Ada L. Gould; but I can say, however, that the investigation showed that goitre speech as a whole is diminished, slightly slow, of remarkably low pitch and harsh. In lay terms it might be called mannish when it occurs in women, whose natural speech is an octave higher than speech in men. In contradistinction, and as an item of differential diagnosis, the speech in neurasthenia is inclined to be fuller than usual in amount, increased in speed, high in pitch and rather quick and reflexlike in nature.

One very interesting case in Cleveland was that of a boy of very harsh speech. We could not find the cause at first. Finally we found a goitre in the mother and concluded the etiology was unconscious imitation. Such cases are rare and need confirmation; but some confirmation was secured last year in a case seen in my speech clinic at the Massachusetts General Hospital, where a boy with a very nasal voice was diagnosed by sound as cleft palate. Examination revealed a normal palate. His father, however, had a very marked cleft which accounted, through unconscious imitation, for the boy's nasality.

DR. MORTON PRINCE: I have a very strong suspicion, Dr. White, that in many of your cases you would find an anxiety. I find in my experience that anxieties are often overlooked. It isn't enough to ask a patient if he has an anxiety or fear, but time and again if you go deep into the matter you will find a fear of some kind which is, perhaps, related to

something he does not suspect, or something he won't confess but which can be brought out very readily by a very searching examination. So I am inclined to think that the anxiety neuroses comprise a much larger proportion of your cases than you have given. It is very easy to overlook an anxiety neurosis.

DR. JAMES B. AYER: I should like to ask two questions. I understood that when Dr. Goetsch returned from Saranac he said that about half the cases treated there for incipient tuberculosis were in his opinion cases of hyperthyroidism. It would seem to me reasonable that the asthenia of the tuberculous patient, coupled with temperature, might make a particularly susceptible sympathetic nervous system which would respond to his adrenal test, giving the picture of hyperthyroidism. I have never heard yet whether he was right or wrong and I would like to ask. Does Dr. Means still consider that there is a metabolic change which is characteristic of hyper- and hypopituitarism as well as hyper- and hypothyroidism?

DR. W. E. PAUL: It is said in regard to thyroid changes that the hyperthyroid cases may become hypothyroid as time goes on. I think I have seen one or two. I would be glad to hear of any others.

DR. HENRY VIETS: Some one has suggested that in cases of encephalitis lethargica the sleepiness may be due to some change in the pituitary. I wonder if Dr. Means knows of any relation of metabolism to the marked lethargy of encephalitis lethargica.

DR. DONALD GREGG: In some cases in which a very positive reaction with adrenalin is obtained how is it possible to tell whether there is not some adrenal disturbance? The thyroid disturbance is barred out but how about the adrenal cases? Do they also react very strongly?

DR. J. H. MEANS: Answering Dr. Myerson's question about nontoxic goitre, the metabolism is always normal in this condition. I think there are two fairly definite diseases, Graves' disease and adenoma. Graves' disease is a uniform hyperplasia of the thyroid gland with hyperthyroidism. Any adenoma may apparently become toxic, then we may get a hyperthyroidism. Under those circumstances there is an elevation in the metabolism but it is always accompanied by clinical manifestations. The goitre patients that are perfectly well except for the lump in the neck have no elevation.

Answering Dr. Ruggles' question about myxedema,—in general the clinical picture runs about parallel with the fall in metabolism. The fall is usually about 25 to 33 per cent. The metabolism level is an indication of the amount of thyroid to give. I think the dose required in individual cases varies a good deal. For example, I may cite the case of a nurse who had an acute thyroiditis, an infectious process. She had had a nontoxic goitre for a number of years. It suddenly increased in size and became very tender and she had a high temperature. The gland was removed surgically and on examination showed a definite inflammatory process, not Graves' disease at all. About three weeks after I found the

metabolism — 15 per cent. She looked perfectly normal. I saw her again about four weeks later. In the meantime absolutely typical myxedema had developed. The drop in metabolism had preceded the development of clinical symptoms. After the administration of thyroid she became normal.

In answer to Dr. Ayer's question, I have had no personal experience with the Goetsch test. I believe that some of the cases which reacted to his test were not cases of hyperthyroidism but were neuroses of some sort. I believe their thyroid glands were not abnormal but that their vegetative nervous systems were unduly active, which is fairly distinct from true hyperthyroidism. Regarding pituitary conditions, there is a change in metabolism in pituitary disease. It is not so constant or so striking as in hyperthyroidism but in active cases of overfunctioning of the pituitary gland there is sometimes an increase of about 40 per cent. and in some cases of hypopituitarism a slight reduction. There is no definite alteration in old acromegalics. Where the process had died down the metabolism is generally normal.

I can answer Dr. Paul's question in the affirmative because recently at the Hospital we have studied a case of mild Graves' disease. The patient's rate was + 50 per cent. only six weeks ago. She had all the symptoms of exophthalmic goitre. After three x ray treatments she came back to the Hospital and I didn't recognize her at all. She presented a picture not characteristic of myxedema but suggestive of it, and her metabolism was 12 per cent below normal. She was given small doses of thyroid and became more nearly normal in appearance. This is the only patient I have ever seen that became definitely myxedemic after x ray treatments. Some of the postoperative cases that I have seen, that suggest myxedema, have a metabolism that is slightly depressed.

Answering Dr. Viets' question, I do not know of any observations that have been made on encephalitis lethargica but we have such a case in our ward at the present time and I should be very happy and interested to investigate it.

Dr. Gregg's question I cannot answer. I think we know very little about primary disease of the adrenals. I have tried to find cases of Addison's disease. We had but one case and this patient showed no change. Cases of recognized adrenal deficiency are very rare.

DR. PAUL D. WHITE: I agree with Dr. Prince except in regard to the effect of excitement on the heart size. The term soldier's heart is satisfactory. I don't think any of the new terms are any better. Anxiety undoubtedly plays a more prominent part than we realize. I recently saw a patient in whom the anxiety neurosis was undoubtedly a factor, a young woman with a disfiguring lupus vulgaris. She had typical cardiac neurosis symptoms. The effect of exercise and excitement on the heart is, of course, to increase the rate and force of the heart beat and, if extreme, one also finds the presence of a systolic mur-

mur. Immediately after exercise the heart is actually smaller than before as proved by the x ray. The force of the heart is such that the apex impulse may give an impression of dilatation on physical examination. The murmur is commonly found at times of excitement, probably not to be explained, however, by dilatation of the mitral ring. My experience is too limited to tell what will happen to these cardiac neuroses as they grow old. Probably they recover. An important point may be the relationship of cardiac neurosis to a latent production of arteriosclerosis. It is possible that one of the factors of arteriosclerosis is the constant strain which accompanies these symptoms in youth. The Goetsch test is very like the reaction of excitement.

Current Literature

II. SENSORI-MOTOR NEUROLOGY.

1. PERIPHERAL NERVES.

Mayer, C., and S. Ostheimer. CONCERNING REFLEX CONTRACTIONS OF MUSCLES IN THE EXTREMITIES, SET IN ACTION FROM THE JOINTS. [Archiv f. Psych., 1919, Vol. 59, p. 462.]

In 1916 one of the authors, Mayer, described what he called the finger-thumb reflex. In the majority of normal individuals, when passive movements are communicated to the first joint of one of the four three-jointed fingers, there is a reflex movement of the thumb. New experiments concerning this reflex are here described and discussed. In by far the greater number (11 in 41) no reflex at all was obtained when the experiment was reversed and passive movements were communicated to the first joint of the thumb, and where a reflex was elicited it consisted in only a light contraction of the hypothenar, or the flexor carpi radialis, or the palmaris longus muscle; these reflexes are capable of being stimulated also from the first joints of the four three-jointed fingers. Discussing the origin of the stimulus which elicits the reflex, the authors state that it apparently results from the excitement of the centripetal paths in the capsular ligament or in the ligamentous apparatus, being, therefore, a true joint reflex, while other phenomena hitherto so designated are really bone reflexes. In Sherrington's phraseology it is a proprioceptive reflex. It seems to be a remaining trace of a primitive synergic movement for grasping and holding objects. The authors assent to the view that numerous reflexes may be regarded as rudimentary functions, and certain peculiarities of the finger-thumb reflex, for example, its inconstancy in different individuals, its incomplete development, and the fact that it is elicited by passive movements, indicate that it is of this character. The results of experiments with 60 soldiers is communicated. The reflex was positive in 105 arms; there were contractions of the hypothenar 54 times, of the palmaris longus 35 times, of the flexor carpi radialis, 28 times; of the flexor carpi ulnaris, once; of the extensor poll. long., once. The indications are that the path for the stimulus causing the reflex is through the 6th cervical root to the 1st dorsal, and that of the reflex motor activity through the 7th cervical to the 1st dorsal. Where there was injury of the brain hemispheres from gunshot wounds or organic disease, the behavior of the reflex suggests that it may be a cortical reflex, while other cases indicate the possibility

of a subcortical (spinal?) localization for the reflex, the innervation of the subcortical site being under the influence of the cerebrum. It is also possible, in certain individuals, to elicit a reflex from the knee joint which belongs in the category of true joint reflexes; by extension of the knee joint a muscle contraction in the upper thigh is produced.

Leppmann, Friederich. POLYNEURITIS AFTER INJURIES. [*Zeitschr. f. d. ges. Neur. u. Psych.*, July 11, 1919, Vol. 49, p. 198.]

In the meager literature on inflammation of the nerves after injuries special value has been placed upon the answer to the question whether an injury without an open wound or wound infection can give rise to a polyneuritis. The author reviews cases in the literature and describes a series of cases observed by him which were of a nature to furnish an answer to this question. He comes to the following conclusions: It has never been proved or shown to be probable that an extensive inflammation of the nerves can be caused by a bloodless injury, or one which has not been infected. General inflammation of the nerves as result of infection of wounds is met with. In a great number of cases of this sort, however, it is more probable that the infection is due to diphtheria. In their course these cases resemble diphtheretic paralysis; there is transitory disturbance of the muscles of the eye, followed later by ataxic paresis of the legs, and there is also rather sudden disappearance of the symptoms. The member which has been injured may be affected by the paralysis but is not always so affected. There are cases of polyneuritis also which result from suppurating infections. The course of all these cases in past experience has, for the most part, been favorable, but in a case of Landry's paralysis observed by the author, there was not complete recovery after nearly a year and a quarter.

Levy-Valensi, J. INCAPACITY FROM ULNAR PARALYSIS. [*Paris Médical*, Oct. 4, 1919.]

Incapacity from ulnar paralysis is greater than it seems. To an outside observer it affects only the two last fingers; but this is not true in reality. The innervation of ulnar nerves in the hand, interossei muscles, adductor muscle of the thumbs, and hypothenar eminence act on every finger.

Levy-Valensi classes incapacities as follows: (1) Incapacity of terminal phalanges of last fingers. There are three degrees: (a) very slight without inconvenience. (b) moderate with great inconvenience when improvement cannot be obtained. (c) with great inconvenience only when the first phalanges are curved and the tips of the two last fingers touch the palm. (2) Incapacity with changes of sensibility. Results of loss of feeling which determines accidents in working. The author notes three cases in which ulnar and brachial cutaneous internal nerves were severed. When the hand was put in cold water the patient felt the sen-

sation of warmth streaming down. The regenerated nerves of the brachial internal cutaneous layer spread in ulnar sheaths. (3) Incapacity with bi-digital prehensile power.

There are two degrees of prehensibility with thumb and forefinger. (a) direct, and (b) indirect.

Direct prehensibility: (1) Strong prehension with phalanges extended. (2) Closer prehension with flexors. The first ulnar nerve preponderates (interossei muscles, and abductor muscle of thumb). The second is chiefly median nerve (flexors of thumb and forefinger). Indirect prehensibility is possible between thumb and outside surface of forefinger. The thumb is moved by thenar eminence muscles (median), the forefinger is held passive by extensor of hand and fingers (radial). In a case of ulnar paralysis the first is null and void, the second weak and with flexion of the last phalanges of thumb and forefinger (Babinsky or Froment), the third is normal. The degree of weakness of bi-digital prehensile power is determined in the following manner: The patient is asked to hold a knife or similar object by the blade between thumb and forefinger. In ulnar paralysis the knife falls down vertically. Normally it would remain horizontal. Levy-Valensi calls this symptom the lever sign. (4) Incapacity of all prehensors of the hand. This is considerably reduced by absence of interossei muscles, deep flexor and abductor muscles of the thumb. The last acts in clenching one's fist. (5) Incapacity of flexors of the hand. This incapacity is not very important. It is caused by the action of the anterior ulnar muscle. (6) Incapacity in complicated acts. Writing is disturbed on account of weakness of bi-digital prehension and difficulty of alternation flexion and extension of thumb and forefinger. The patient has to write with wrist and fore arm and is quickly tired. Great difficulty is experienced in carving, holding thin objects on a smooth plane, handling money and putting it in the pocket, etc. The causes of these last incapacities Levy-Valensi believes to be: fibrous transformation of interossei muscles, and adductor muscles of the thumb. In anomalies there is subordination of every finger, minimum flexion of the second phalanx of the forefinger and third finger, on the first one when acting, absence of abduction of fingers with adduction when flexing them.

The author examined wounded men in numerous professions and in every one noted one special incapacity. One doctor whose right arm was wounded could not make perfect abdominal palpation, throat examination, lumbar puncture, etc. A veterinary surgeon, violinist, pianist, wood carver, chimney-builder, batter, butcher, tailor, hair-dresser, basket-maker, turner, mechanic, typist, printer, moulder, cooper, accountant, sailor, farmer-artisan, blacksmith, farmer, etc., were also examined. The conclusion is that ulnar paralysis is an incapacity that is valid for indemnity, and this indemnity should be placed at between 40 to 50 per cent. when the right side is injured, and from 30 to 40 per cent. when the left side is injured. [Author's abstract.]

Gaugele. RADIAL PARALYSIS. [Deut. med. Woch., Nov. 20, 1914.]

Radial paralysis nerve operations having failed to bring about good results, Gaugele is of the opinion that Perthes and others have done good service in reintroducing the method of tendon transplantation. Tenodesis, recommended by Perthes, may be indicated if the paralyzed muscles look pale or yellow, but can be dispensed with, as it renders the operation more complicated. Separating the paralyzed muscles from the tendons is not good, as such muscles often recuperate when put to work. In place of Perthes' method of uniting the flexor and extensor muscles, he prefers that of Vulpius' buttonhole. The distribution of the flexor muscles is best made in the direction that the extensor muscles run, that is, the flexor carpi ulnaris is attached to the extensor communis and extensor pollicis longus, and the flexor carpi radialis to the other muscles of the thumb. The extensor carpi ulnaris and the extensor carpi radialis longus may, likewise, be attached to the flexor muscles.

Spitzzy, Hans. OPERATIVE TREATMENT OF PARALYSIS OF N. RADIALIS. [Archiv. f. Psych., 1919, Vol. 59, p. 652.]

Injuries of the radial nerve are very frequent because of its exposed position. In the war this nerve was injured more often than any other, and from the very beginning efforts were made after good results. The author writes from the observation of 856 cases of wounds of this nerve, 585 of which were carefully followed. He draws the following conclusions: In injuries of the radial nerve, where there is still sensory and motor conductivity, operation should not be immediately undertaken, but careful faradic treatment used with special stimulation of the nerve. To avoid stretching the muscles the abnormal position of the hand should be corrected by the proper apparatus, thus preserving the use of the hand. When the nature of the wound and thorough examinations extending over a period of several weeks made it probable that the continuity of the nerve has been fully interrupted, the nerve should be laid bare for the purpose of exploration. If not entirely severed, or, if the ends lie in a favorable position for reuniting, or if connected by a soft neuroma, all tissue causing pressure on the nerve should be removed and the wound closed again, so that spontaneous healing may take place. If the nerve is fully severed and there is any considerable distance between the ends, then after the ends of the wound in the cross section have been freshened, they are to be reunited by a perineural suture. Where there is non-conductivity because of hard cicatricial tissue between the ends, this tissue is to be removed and, where possible, the clear cross sections of the nerve sutured. If the ends cannot be approximated the gap should be bridged. Though the experiment of inserting pieces of nerve was made with the ulnaris and other nerves, the author is not able to report good results. There was spontaneous recovery in a large percentage of the cases. In all, 129 cases were operated on and in 59 of these sutures

were made. Thirty-five cases were followed and 27 improvements and 8 failures were noted. It was found that, even after thirty months, improvement may take place in separate muscles. If the nerve suture is not successful, and there is no prospect that the function will return, measures should be taken to avoid the dropping of the wrist. The operation favored by the author was to utilize the flexor of the wrist joint for extending the hand. The flexor is drawn through the spatium interosseum and made fast to the back of the hand. The subperiosteal method is preferred and the operation is made under local anesthesia, because as soon as the suture has been effected the patient may be made to move the hand, and, if results are not satisfactory, corrections may be immediately undertaken.

Bregman, L. E. CONTRIBUTIONS TO POLYNEURITIS. [Neurol. Centralbl., September 1, 1918, No. 17, Vol. 37.]

Diplegia Facialis in the Frame of Sensori-ataxic Polyneuritis.—The author's patient was a woman, 38 years of age. Diagnosis was not difficult, for, from the following symptoms, the case could certainly be assumed to be polyneuritis as there was typical disturbances of sensibility and parasthesias, hyperalgesia of the nerves and muscles, ataxic disturbances, typical behavior of the reflexes, absence of bladder disturbances, and, finally, the psychic disturbances (slight Korsakow). In all probability the polyneuritis stood in relation to a puerperal involution. The motor functions aside from the ataxic disturbance were preserved, and, for this reason, the presence of an almost complete paralysis of the facial nerve on both sides, together with certain abnormal reactions of the same, was remarkable. Although variability in the symptoms of polyneuritis is to be expected, both in regard to the relation of the motor disturbances to those of sensibility and in regard to the occurrence of the paralysis, yet the isolated diplegia facialis in the frame of a sensori-ataxic polyneuritis is very rare. The author finds only one analogous case in the literature, namely, one observed by Strümpell and, later, by Altheus. Involvement of the facial nerve is somewhat more common in the ordinary motor form of polyneuritis, although here, too, it is somewhat rare, much more so than involvement of the bulbar nerves. The author's case seems to stand in a certain relation to cases of isolated peripheral facial paralysis accompanied by symptoms indicating affection of other nervous regions, such as parasthesias, symptoms of weakness in the limbs, pain in the face, disturbances in the occipital and cervical regions, etc. Where there is only unilateral facial paralysis, symptoms of this sort seldom accompany it. On the other hand such phenomena were very pronounced in a case of bilateral "rheumatic" paralysis with bilateral facial paralysis and disturbances of motility in the lower extremities, which the author published in a previous article. Peripheral "rheumatic" facial paralysis seems, however, to be also extremely rare. The author never met with a second case, and, in Hübschmann's com-

prehensive review, very few are mentioned. The author's case has some resemblance to the polyneuritis cerebri menièreiformis of Frankl and Hochwart. In these cases, on a toxic infectious basis, there is acute disease of various brain nerves; of the facialis, acousticus, trigeminus. Because of the involvement of the vestibular nerve Menière's symptoms are manifested, vertigo, nausea, vomiting. In the author's case the latter symptoms were absent although there was an affection of the acoustic nerve (especially on the left) and of the N. trigemini. In Frankl and Hochwart's cases the phenomena were mostly unilateral and the ataxia and disturbances of sensibility were absent.

Isolated Paralysis of the M. extensor pollicis longus in Polyneuritis.—The case was that of a merchant, fifty years old. The etiology of the disease was unknown. The nervous disturbances had begun three months before the patient came to the author's observation, the first symptoms having been pain, and, in the lower extremities, paresthesias. The left upper extremity was somewhat weaker than the right and there had been pains in the hand joint. At the time the author made his first observation the patient could not stand without assistance. The case was a typical polyneuritis. The lower extremities were the ones principally affected, on the right side more than on the left. Of the upper extremities only the left was affected and only to a slight degree. The brain nerves were not involved. Sensibility was disturbed to a slighter degree than motility. This case, of which the symptoms were so usual that they awakened no great interest, was complicated about a week after the patient's admission to the hospital by a symptom so unusual as to immediately attract attention. The patient's left thumb hung down limply and he was unable to raise it. He could bend it, the abductens and opponens were unaffected, but he could not extend it. Sensibility was preserved. Partial radial paralysis is of rather frequent occurrence; a traumatic injury, for instance, can be limited to the N. radialis profundus and then the paralysis affects only the Mm. ext. dig. comm., ext. pollicis and abd. poll., indicator, ext. carpi ulnaris. An ether paralysis may affect only certain muscles. Lead poisoning offers the most striking example of partial radial paralysis due to toxic influences. Polyneuritis affects the extensor muscles of the fore arm more strongly than the other muscles and toxic infectious multiple mononeuritis or disseminated polyneuritis is not rarely limited to the upper extremities, leading to partial radialis paralysis, but the author states that isolated paralysis of the M. extensor pollicis longus has never been observed by him in any other case.

Pseudo-athetotic Movements in a Case of Polyneuritis Recidivans.—The author's patient was 70 years old, and, twelve years before he had come to the hospital section and a diagnosis of polyneuritis was made. The patient recovered after six months. Six years later he suffered a similar attack, and the third relapse brought him again to the author's

observation. The diagnosis of polyneuritis was not difficult to make. The recidivating form of polyneuritis is seldom met with. Remak in his well known monograph has collected only five cases from the literature. Hoestermann, who has published three cases from the Heidelberg clinic, calls attention to five other cases. Higier also described a case which belongs in this category. Of the numerous cases of polyneuritis that come to the author this is the first of this sort ever observed by him. These cases differ greatly from each other in regard to the form of the paralysis, the interval between the separate attacks and the severity. Remak is of the opinion that there is tendency to intensification of symptoms with repeated attacks, but this was not apparent in the author's case. Schüffner is inclined to extend to polyneuritis the important discovery of Funk concerning Beri-beri, namely, that this disease occurs when certain elements (vitamines) are lacking in the diet, and the author is of the opinion that, in many cases of polyneuritis where, hitherto, the etiology was obscure, this factor may have had an influence, and the gastric disturbances which sometimes precede recidivating polyneuritis may be an indication of this cause, but, in the author's case, such disturbances were not present. The involuntary movements of the upper extremities in the form of a constant restlessness were remarkable. These were resisted by a tonic straining of the muscles which led to the fixation of the hands in peculiar positions, recalling athetosis. This is a very rare symptom in polyneuritis, and may be understood as an extreme disturbance of coördination. It is well known that when the body is held at rest the musculature is by no means entirely relaxed, there being always a certain degree of tension, each muscle group having an exact quantity thereof. On this condition the static coördination is based. If this tension is destroyed the tonus for the separate muscle groups cannot be made to correspond to the need and the result is that the muscles are jerked here and there. It may be easily understood that this phenomenon is especially noticeable in the fingers, where the quantity of the tonus of the separate muscles must be accurately measured. The question still remains unanswered, however, why this sort of spontaneous movement is so rarely observed in polyneuritis, notwithstanding the fact that ataxic disturbance of a high degree is a frequent symptom of the disease. It may be that a special proportional relation of the disturbances of coördination to the muscle paralysis is necessary to produce these phenomena, or, for the explanation of the spontaneous movements, that an exaggerated general irritability of the nervous system of and for itself conditions a certain muscular restlessness, thus making greater demands on the static coördination.

Sterling, W. POLYNEURITIS AFTER LIGHTNING STROKE. [*Neurol. Centralbl.*, Sept. 1, 1918, No. 17, Vol. 37.]

The effect of atmospheric electricity on the human organism has been the subject of a long series of published works, but most of these

principally treat the death-producing effects and where attention has been given to its effects on the nervous system it was usually only one feature of this influence that was investigated, namely, the brain paralysis in hemiplegic or monoplegic form, which usually sets in immediately after the accident and recedes again after a time. Charcot who was the first to analyze clinically this symptom regarded it as wholly hysterical. Following him came a whole series of neurologists inclined to see in the entire neurological and clinical picture after lightning stroke only hysterical phenomena. That this understanding is not in keeping with the present advances of science later publications have shown, and the author offers a case as additional proof. A man, sixty years of age, was struck by lightning in the lumbar sacral part of the vertebral column. The lightning tore the clothes of the patient at the back and burned the upper part of the left thigh. Eight days afterwards the patient came under the author's observation. The clinical picture deserves attention first of all because there was no loss of consciousness immediately after the accident. In by far the greater part of the cases in the literature there is more or less disturbance of consciousness connected with symptoms, which, to a certain extent, resemble concussion of the brain. The disturbances began with an akinetic stadium with complete preservation of consciousness. What was the cause of the akinesis? After careful consideration he thinks that it must be of a functional nature, but these functional disturbances by no means exhaust the clinical picture. Symptoms indicating very definitely an inflammation of the peripheral nerves, developed after the lightning stroke, namely, extreme pain to touch in the muscles and nerves of the calf and alteration of the quantitative sensitiveness of the muscles to electrical stimulus and, above all, destruction of the Achilles reflexes. The course of this polyneuritis may be regarded as relatively favorable for no clearly defined paralysis was discernible; the neuralgic phenomena, severe at first, receded after a week and a half, leaving only slight painfulness of the nerves and muscles to pressure. The Achilles tendon reflexes on the left side which at first was totally absent, together with that on the right, was, after four weeks entirely restored. The clinical picture was finally rounded out by a certain abnormal psychotic condition; the patient was restless and depressed, inclined to weep on the slightest provocation. This picture corresponds to the psychic condition in the so-called shock neuroses. Oppenheim gives a special name to neuroses following lightning shock and these conditions are to be distinguished from the "functional" symptoms in the general sense of the word, and especially from the hysterical phenomena (which arise entirely from pathological ideas) because they always originate in a change of the nerve substance; they are always due to material causes, though perhaps to very fine ones not discernible by the coarse methods of examination in use. It is of importance that the diagnosis of traumatic neurosis, following accident could in this case, for the first time,

be confirmed by an objective symptom, and, in truth, by the so-called Mannkopf sign, that is, the acceleration of the pulse upon pressure on the sensitive part. Thus the clinical picture of the author's case consists of three components: first, of the akinetic symptoms of functional nature, in the first phase of the disease; secondly, the symptoms of the multiple neuritis; thirdly, those of the so-called traumatic neurosis. While the symptoms of the first and third categories are by no means rare, the strictly organic complex of class two is not often met with after lightning stroke. Numerous references to the literature on the symptoms in class one and three are given, but the author was only able to find two cases of polyneuritis with close resemblance to the symptoms composing the second class in his own case. One of these was a case of Jellinek's with neuritis of the *nervus radialis*. The second was described by Willige; after a short initial stage of neuralgia, a peripheral paralysis of the right lower thigh developed which, however, receded, after a few months. In regard to the prognosis, it is clear that in each case it depends not only on the individual disposition, but also on the number, depth, and extent of the foci of changes caused by the lightning stroke in the central and peripheral nervous system. Our knowledge of these changes we owe to Kratter, Corrado, Swietalski, and Jellinek. These experimenters have found in animals and men, where death was due to electricity, vacuoles, displacement of the chromatin substance, destruction of the nuclei of the ganglion cells in the brain. Jellinek found in animals extravasation, especially in the gray substance in the neighborhood of the central canal, bleeding in the central canal and products of decay in the nerve cells together with secondary degenerations in the medulla oblongata which recalled those of *tabes dorsalis*. In men he found extreme hyperemia of the capillaries of the cervical region of the medulla, changes of the nerve cells of the brain and medulla in the form of chromatolysis, tigrolysis, blurring of the cell nuclei, swelling of the axis cylinders, excentric distortion of the cell nuclei up to the periphery and even to the protoplasm processes. Upon the ground of his experiments and histological examinations Jellinek rightly abandons the earlier view that the symptoms after lightning were only functional. When the facts are viewed in this way, the main difference between functional and organic symptoms vanishes, for the latter are only intensified forms of the former. This approaches Oppenheim's theory of the neuroses. This view, however, should not exclude the mechanism by which certain symptoms originate in a psychogenic manner. After the lightning stroke there was a whole series of symptoms of hysterical nature, but quite different from the functional symptoms in the sense in which Jellinek, following Oppenheim, uses the word. These functional symptoms so understood in no way form a connecting link between the organic and hysterical symptoms, as Hoche maintains, but are something entirely apart from the organic.

Wirschubski, A. A CASE OF POLYNEURITIS FOLLOWING INOCULATION FOR RABIES. [Neurol. Centralblatt, September 1, 1918, No. 17, Vol. 37.]

Following inoculation for rabies phenomena of paralysis have been observed, beginning sometimes during the treatment and sometimes within the first week after the cure. Fortunately these complications are rare (0.48 in 1,000 persons). They occur usually in male adults. The course of this complication is in the direction of recovery, and fatal terminations are rare. The paralysis lasts from a few weeks to many months. The clinical picture is usually that of an infection of the medulla oblongata, more rarely that of a disease of the peripheral nerves (polyneuritis), and cases such as the author here describes are seldom met with. In this case, not only the peripheral nerves were affected, but the cerebral (N. facialis, abducens, oculomotorius, and glosso-pharyngeus) were involved. Knowledge of polyneuritis of this etiology is extremely meagre. Bing who, in his comprehensive monograph, describes the etiology of polyneuritis from intoxication does not even mention inoculation for rabies. In a former number of the Centralblatt attention was called to the rarity of polyneuritis so originating. The paralytic conditions are not caused by the rabies poison, for it is known that paralysis follows in cases where the dog, later, is found to have been healthy. It can only be concluded that the immediate cause of the paralysis is the poison introduced by the injection of the protective virus, and, in addition, a peculiar disposition in the individual must be assumed to exist; the rôle that this latter plays in the paralysis is shown by the fact that its occurrence does not depend on the strength of the dose nor on the length of time it is continued. But the main support of the theory of individual idiosyncrasy is Borger's statistics from Java of 2,130 Europeans inoculated, 11 were affected with paralysis; of 4,268 Islanders, only a single one. In the author's case, a few days after the patient, a railroad employé, 50 years of age, was bitten, the cure was begun and was continued for about a week. Several days after the termination of the cure the patient began to feel pain in various muscles and nerves and this was followed by paralysis of the lower extremities as well as by a pronounced diplegia facialis with disturbance in articulation and entire inability to swallow. After the patient was taken to a sanatorium, further symptoms were observed,—retention of urine, diplopia, ptosis, and paralysis of the N. abducens sinist. The therapy consisted in injections of strychnine and galvanization and the symptoms receded, more rapidly on the right side than on the left, and in about one and one half months had disappeared. The disturbances were principally motor in character, those of sensibility playing a very unimportant rôle.

2. CRANIAL NERVES AND MEDULLA.

Saenger, Alfred. PERMANENT CEREBRAL BLINDNESS AFTER INJURY TO THE OCCIPUT. [Neurol. Centralbl., April 1, 1919, No. 7, Vol. 38.]

Wilbrand, in his book, "Injuries to the Visual Paths of the Brain," states that no case of permanent bilateral blindness from bullet wounds in the occipital lobes has been published. Heilig and Berger have recently mentioned cases of this sort, but their patients died in a short time from meningitis, so that it was impossible to determine whether these would have recovered their sight upon recovering from the meningitis. The author sought further evidence on the point by following the fortunes of those who had been blinded in the war, and he was able to make personal observations of one case of permanent blindness from injury to the occipital lobe, that of a young man who was wounded in the occiput by a splinter from a mine, and was unconscious for seventeen days afterward. For one and one half years he was entirely blind in both eyes. Then, in the right, a slight film of light appeared and after four months again disappeared. Later this eye improved so that he was able to discern the outlines of objects and later he became totally blind. For some time after the injury there was bodily weakness, disturbance of speech and roaring in the ears, but these phenomena disappeared gradually. Examination of this very intelligent and mentally active man showed that he had no perception of light on either side. The pupils were equal and reacted promptly to direct and indirect light and in convergence. The movements of the eye were free in all directions. The optic memory was preserved. The fundus oculi was normal on both sides. According to his statement there had been deafness on the left side ever since the injury. Aside from this, the functions of the brain nerves were normal. Examination of the nervous system showed normal conditions. As for the injury, there was a brain hernia as large as an apple in the middle of the occiput above the protuberantia occipitalis, through which the pulsation of the brain could be observed. This case confirms the view that the function of vision is exclusively located in the occipital lobe. The author thinks that cases of this sort are probably rare, the nature of the wound being so serious that the individual so injured rarely survives.

Mann, Ludwig. DISTURBANCES OF THE SENSE OF LOCALIZATION IN THE RETINA. [Neurol. Centralbl., April, 1919, No. 7, Vol. 38.]

The author here describes a disturbance of vision in the form of loss of the sense of locality in the retina, that is, the light stimuli which reach the retina are perceived, they penetrate to the visual cortex, but convey a false impression of the position of the points or objects seen, in consequence of which these latter are erroneously projected. In 1903 the author described a similar case, which he called a disturbance of the retina, and, later, Professor Lenz also noted disturbances of the same

character. This abnormal phenomenon is purely perceptive and must not be confused with the well known disturbance of dissociation in the optical central apparatus (disorientation, mind-blindness, etc.). Of course such a false localization of objects seen must involve, secondarily, a certain disorientation, because the incoherence between the positions falsely given by vision and the real positions given by the other senses would constantly mislead the subject. In the sort of "disorientation" which frequently accompanies bilateral and unilateral hemianopsia the patients see all the separate objects of the environment in the proper places, but they are unable to use the pictures that have fallen on the retina, and are especially unable to reproduce familiar objects in their spatial relations. They are suffering from a loss of visual memory. The phenomena in the author's cases are of an entirely different nature. They were able to form spatial ideas correctly and to give proper descriptions of the localization of objects. They could, for instance, describe the positions of familiar objects in a room, or well-known routes, and could also find their way about, but they were constantly running into objects because they could not accurately judge positions in space. The phenomena also differ from the disturbance of the perception of depth, the judgment of superficial projections only being here involved. The perception of superficial projections, *i.e.*, the recognition of co-existent points in the same plane is dependent upon vision exclusively, while the recognition of dimensions of depth is a complicated act of association, the anomalies of which are brought about by a dissociation of the elements of which the act is composed. The author suggests the name paropsia for the disturbance he describes because it is brought about by a "para" functioning—a false performance of the function of vision. Although paropsia has not hitherto been regarded as a separate affection, conditions of this sort have, nevertheless, been described by Zeuner, Greuger, Hartmann, and others. Beyer observed a similar phenomenon in himself during a passing attack of entoptic scotoma, and he assumed that the functional disease (trophic or circulatory) which gave rise to the scotoma caused the stimuli arriving at the retina to be falsely combined, resulting in a sort of dissociation. In one observation of the author's an interesting complication arose. Besides the organic cerebral disease there was a hysterical reaction connected with a legal process over a pension, and the patient when he presented himself had the appearance of being almost entirely blind. The hysterical blindness was cured, but a residuary paropsia remained for a long period. A post-mortem was performed on one of the author's cases. In the macroscopic examination carcinoma metastasis was found in both hemispheres. In the right there were two tumors in the region of the parietal lobe; but they did not reach to the cortex in any part, remaining at least 0.7 cm. distant therefrom. In the left hemisphere there was a tumor lying principally in the occipital lobe which also did not reach to the cortex, remaining at least from 0.3 to 0.5 centimeters distant from

it. These post-mortem findings confirmed the opinion of the author, formed on theoretical grounds, that the paropsia was not due to disease localized in the cortex but to a disturbance of conduction in the region of the optical tracts, *i.e.*, of the optic radiations.

Strohmayer, W. RIGIDITY OF PUPILLARY REFLEXES TO LIGHT AND WESTPHAL'S SIGN AS AN ANOMALOUS HEREDITARY TENDENCY. [Neurol. Centralbl., July, 1919, No. 13, Vol. 38.]

In view of the cardinal importance of the absence of pupillary reflexes to light and of the patellar reflexes as signs of organic metasyphilitic disease of the central nervous system, the fact must not be lost sight of that there are rare cases where the presence of these symptoms may lead to a false diagnosis because they may have another foundation. The author, twelve years ago, published the cases of two sisters who manifested symptoms of tabes—absence of patellar reflexes on both sides. The Wassermann blood test was at that time unknown, but a luetic etiology seemed to be contradicted, while the history of the family revealed, in the ancestors, chronic alcoholism, diabetes, and affective psychoses—all pointing to hereditary constitutional degeneration. The author at that time was inclined to believe that the two sisters were suffering from a tabetic disease that was progressive, arriving at this view in consideration of the facts that tabes is of slow development; has a close relation to diabetes, and in its hereditary course may alternate with diabetes, as is also the case with hereditary ataxia. After following the case for a long period, however, and finding that the subjects remained in the best of health and that the Wassermann test, which could now be applied, turned out negative, he was persuaded that the absence of patellar reflexes and the pupillary rigidity was due to a rare familial tendency. Two other cases of absence of patellar and Achilles reflexes with otherwise healthy central nervous system are cited. Such phenomena, however, should not be too easily judged non-syphilitic, for the author describes cases—a brother and sister—in whom from early youth the pupillary reflexes to light on both sides had been absent and in whom there was bilateral strabismus divergens. A familial locus minoris resistentiæ was the first solution to suggest itself, but the cases were otherwise explained when the blood test in the father showed positive result. This cases is clear, but there are others where it is almost impossible to decide whether the disturbance is of metasyphilitic origin or due to hereditary degeneration. For example the parallel fortunes of a brother and sister whose parents were first cousins is interesting. The sister at 35 years of age manifested symptoms of mental deterioration, restlessness, tactlessness, carelessness in household and dress, kleptomania, and also developed epileptic attacks. Because the patellar and Achilles reflex could not be elicited the diagnosis of beginning paralysis was made, but no further signs of paralysis were shown,

and her mental condition grew no worse. At the same age her brother developed similar symptoms, mental deterioration and epileptic attacks, and in his case, too, the patellar and Achilles reflexes were found to be absent. The author thinks it probable that the disturbances in this brother and sister were due to a familial anomalous tendency leading to a glia degeneration which, in the brain, was the foundation of the epileptic attacks, and, in the spine, the foundation for the absence of the reflexes.

Best, Dr. DISTURBANCES IN THE OPTICAL SENSE OF LOCALIZATION DUE TO WOUNDS OR TO DISEASES SITUATED IN THE OCCIPITAL LOBE. [*Neurol. Centralbl.*, July 1, 1919, No. 13, Vol. 38.]

In a recent article Mann describes a perceptive disturbance of the optical sense of locality which he calls paropsia, stating that in the literature he had found no express mention of this symptom form. Best claims that Mann has overlooked the work done by the author and Poppelreuter on the injuries of the visual sphere from wounds received in war, and further that Mann has failed to show the relations in which the disturbances of localization stand to other disturbances of the optical sense of locality, as, for example, to the loss of the estimate of distance, to hemianopsia, to disturbances of the perception of depth (which Mann erroneously regards as an associative act), to micropsia, to macropsia, etc. He thinks the attention given in the literature generally to visual disturbances is not in keeping with the importance of the eye and its paths as the main organ for perception of all that is not in immediate contact with the body. In referring to experiences from the war particular stress is laid on the frequency of optical disturbance of the sense of locality. Kleist, for instance, states that "optical agnosia for objects" is considerably less frequent than "optical agnosia for space." The term agnosia, however, is misleading, seeming to imply defects of association rather than those of sense. The author notes the great importance of distinguishing these latter disturbances (perceptive) from those of thought and ideas that only have reference secondarily to the sense organ. If the patient sees an object in a false position and for that reason grasps past it, there can be no doubt that this is a disturbance of visual sensation with the erroneous motor action depending thereon, and it is quite different from the loss of power to describe the position of familiar streets and to form ideas of the places of familiar objects, *i.e.*, from disturbances of association. It is to perceptive disturbances that the author refers in his present article. Such symptoms are relatively frequent as result of injuries to the eye region. There may be good central acuteness of vision and a wide visual field with total loss of optical localization; so that patients grasp past objects in a most fumbling manner. When they are questioned about objects they see they cannot indicate the directions of the same, or acknowledge their inability to

locate things familiar to them. They cannot count objects by the eye, although they enumerate readily by touch and their ability to count is intact as well as their tactile sense of position and their stereognostic sense. The author gives a description of the methods he used in measuring the degree and character of these disturbances of the sense of space and his observations are summed up as follows: in the periphery of the visual field, to a degree corresponding to the apparent curtailing of the plane objective field, the patient grasps past objects in a direction toward the center of the visual field. Every deficiency in the visual field is connected with an error in localization. This error is dependent on the position of the eye in the field, that is, on the degree of deflection of the eyes from the primary position. In hemiamblyopic regions, too, there may be an apparent curtailment in the plane objective field. These errors of localization are soon corrected by a process of adjustment so that they are only noticeable when the correction fails or is not made promptly. The disturbances of localization which are independent of the hemianopsia and those which occur where there is no hemianopsia have the character of a disturbance of the relations of the visual space to the position of the eyes and the head. Even when the relations of the things seen to each other are rightly preserved and the field of vision is intact the visual world seems "floating in the air," as it were, unless at least the primary position of the eye is given. The slighter degrees of this class of visual disturbances of the sense of locality manifest themselves by uncertainty in visual estimates, in errors in counting objects seen, and in difficulties in finding objects with the eye. These slight disorders, however, are usually found in connection with more or less severe unilateral weakness of vision, with hemianopsia, etc., being present in about 38 per cent. of disturbances of this nature from recent wounds. Mann considers these disturbances of visual localization to be symptoms of a disease of the optic radiations and not of the cortex. The author disagrees with him and assumes special cortical areas, lesions of which are responsible for the disturbances offering in proof the fact that while they are rare in localized diseases, they are very frequently encountered as the result of wounds. In cases of this sort the cortex is naturally the part that is first injured, the deeper fibers being only secondarily involved, if at all. Besides, the author has seen the symptom of disturbance in counting where there was only a very superficial wound of the cortex. He concedes, however, that such wounds might lead to injuries of the deeper parts, through commotion or bleeding. He gives a sketch of his understanding of the relation of the optical sense of location to the organization of the visual sphere as a whole, and does not think the visual sense depends on the stimulus of the calcarine fissure solely, but on a stimulation of the occipital lobes, generally, together with the peripheral organ. Physiological components may be discovered making up sensation which, psychologically considered, that is, from the

point of view of self-observation, cannot be analyzed into parts. These complexes may be called "processes of perception" following Poppelreuter, and include the sense of direction, of motion, of depth, of size, of color, of form, and the capacity of complementary reproduction. The subject is not able to distinguish these complexes from pure or crude sensations because no unformed or spatially indefinite visual sensation is ever given in consciousness. Accordingly the author assumes that the calcarine fissure is only the place of the joining of the binocular images, and, that in the cortex of the occipital lobes, in separate localizations, are situated the regions upon which depend the sense of locality and those which give rise to optical form. Lesion of the calcarine fissure cause only defects of fusion (and the disturbances of localization due thereto—reduction of fusion). All of the components belonging to the sensation complexes may be disturbed independently of these fusional defects. Those motor reactions which are controlled optically are (up to a certain exceptional position of the fusional movements) produced also by the visual sphere as a whole, the particular reaction being decided by the component which is most strongly emphasized. Beyond the optical phenomena due to disturbances of components belonging to the sphere of sensation are optical disturbances of thought and association which, the author states, are beyond the scope of his article.

Goldstein, Kurt, and Adhemar Gelb. THE "TUBE-FORMED VISUAL FIELD," TOGETHER WITH A MECHANISM FOR EXAMINING THE FIELD OF VISION AT DIFFERENT DISTANCES. (Preliminary communication.) [Neurol. Centralbl., November 16, 1918, No. 22, Vol. 37.]

Leaving all theoretical discussion for a future article, the authors simply give results. Where there is suspicion of so-called "tube-formed" vision or of similar disturbances in patients, the campimeter is used for measuring the periphery of the field of vision at various distances from the eye. This method is chosen because of its simplicity, and it is assumed that, taken all in all, it makes little difference whether the campimeter or perimeter is used. The linear measures gained by the campimeter method are computed in the corresponding angle values under the belief that the values thus obtained must conform nearly to those which would be obtained, if, under similar conditions, the field of vision were examined by the perimeter. It is well known, however, that the two methods do not agree in every respect, the most important variation being the essentially different psychological conditions arising in the examination—a fact which has hardly been taken into consideration. Indeed, in respect to the psychological conditions, the two methods differ so greatly that it is questionable if the results can be compared. Yet, while the examination of the periphery of the field of vision by these two methods leads to such different results qualitatively, it is,

nevertheless advantageous to determine what relation exists between the extent of the field of vision at various distances in a series of measurements made by the campimeter, compared with the same series at various distances made with the perimeter; so that the former may be used instead of the latter in cases where the only problem is to determine the relation between the extent of the field of vision at successive distances, as, for instance, whether there is tube-form concentric vision or not. In order to do this, comparatively experiments must be made with the two methods before the results obtained by the campimeter are generally made use of. The authors employed a special mechanism with the perimeter in order to obtain angles comparable with those given by the campimeter. Experiments were first made with subjects suffering from organic diseases, and these showed that with the same patient the angle indicating the extent of the field of vision at various successive distances increased slowly with the perimeter, while it decreased to a very considerable degree with the campimeter. The same experiments were then made with patients with functional nervous disturbances. In these cases also, where there is hysterical disturbance of the field of vision, the authors found, just as in patients with organic disease affecting vision, differences in the results of examination by the two methods in the sense that the absolute dimension of the field of vision diminishes proportionally to the distance with the campimeter, while with the perimeter it increases in proportion to the distance. But, in contrast with the results in organic disease, when the campimeter is used in functional diseases, not only does the size of the angle diminish as the distance from the eye increases, but this diminution is so great that the field of vision has the so-called "tube-form." With the perimeter there is no trace of such phenomena, the "tube-form" phenomenon only making its appearance when the campimeter is used. It has already been suspected, from the behavior of patients with functional disturbances of this sort, that the "tube-form" phenomenon was not always present, that is, such patients did not always see as through an enclosed tube. The attempt has been made to explain the appearance of the "tube-form" phenomenon by assuming that when the examination of the field of vision is made the patient finds himself under peculiar circumstances, so that he is constrained to keep his attention on the point of fixation, and the "tube-form" vision is conditioned by the concentration of attention on this point. The comparison of the tests by both methods throws an entirely new light on the whole question by showing that the concentration of attention on the point of fixation cannot be the sole deciding factor, because when the perimeter is used the patient also concentrates his attention on the point of fixation and still has no "tube-form" field of vision. An important result is thus obtained by the additional test with the perimeter, namely, the proof that the field of vision of the hysterical patient in reality is not "tube-form" when the patient is not seated before the campimeter—therefore, that it is not

"tube-form" under the ordinary circumstances of life—a condition which had not been suspected. That the "tube-form" phenomenon is nothing more than the product of the campimeter test has not as yet been proved by the writers' further experiments, but these are not as yet completed.

Pick, A. THEORY OF THE TOPOGRAPHICAL ARRANGEMENT OF VISUAL TRACTS AND CENTERS. [*Neurologisches Centralblatt*, January 16, 1918, Vol. 37, No. 2.]

The author, fearing that a recent sketch by Henschen might give rise to a misunderstanding of theory of visual localization, here offers some explanatory remarks. Henschen claims that Wilbrand is the only writer in accord with his views. The author states, however, that he himself agrees entirely with Henschen and that Henschen cited the author's work in 1900. In a paper entitled "Researches on the Topographical Relation between Retina, Opticus and Crossed Tract in Rabbits," the author said it was the task of further experimentors to determine whether a similar close topographical relation could be proved in the continuation of the visual tracts and in the ganglionic regions. From his experiments such a connection seemed probable; they indicated an entirely constant relation between the retina and the centers of the occipital lobe. The author also agrees with Henschen in recognizing the significance of the most precise knowledge possible of the primary sensory areas for a comprehension of the mechanism of thought, and he called attention nearly twenty-three years ago to the fact that just in such phenomena one lifts a corner of the veil which still hides the secret of thought. Thus, long before the work of Wilbrand, whom Henschen mentions as his sole precursor, the author, following Binswanger and Munk, foreshadowed Henschen's views

3. SPINAL CORD.

Araoz, Alfaro G. CEREBROSPINAL FLUID. [*Ann. d. l. Fac. d. Med. d. Montevideo*, July-Aug., 1919.]

This paper discusses the general findings in different pathologic conditions, especially in doubtful meningeal inflammations. In one sudden onset of what appeared to be tuberculous meningitis under mercurial treatment recovery was soon complete. The father was syphilitic. Another developed similar symptoms but the lumbar puncture showed much albumin and urea, and the child improved under treatment. Two weeks later headache and convulsions recurred and the puncture fluid then showed 7.4 per thousand chlorids and 3.45 urea, and necropsy disclosed tuberculous pyelonephritis but no meningeal lesions. The author notes that otitis may be misleading but lumbar puncture will exclude meningitis, and the meningeal symptoms often subside by membrane puncture.

Dolley, David H., and Frances V. Guthrie. (i) PIGMENTATION OF NERVE CELLS. (ii) LIPOCHROME A PLANT CAROTINOID PIGMENT. [Journ. Med. Research, 1919, Vol. XL, 295.]

The prevailing opinions of the origin of the fat-holding or lipochrome pigment of the nerve cell have been either that it is a by-product of cell metabolism, an "Abnutzung" or "wear-and-tear" pigment, as designated by Lubarsch, or a more specific product of fat or fatty acid metabolism, the lipofuscin of Borst and Hueck. While its possible identity with the lipochrome of plants has been surmised, the microchemistry alone, in its state of progress, has been insufficient to demonstrate it.

However, recent biochemical and physiological studies have demonstrated that the plant pigments, now generally known as the carotinoids (carotin and xanthophyll), are intimately associated with animal metabolism. Palmer and Eckles and, later, Palmer alone, have shown that the natural yellow pigments of the milk fat, body fat, corpus luteum, blood serum or skin of such animals as the cow, horse, and hen, are identical with carotin, or xanthophyll, or both, as the case may be. Palmer has proved experimentally that chickens, deprived from birth of carotinoid pigments, show absence of yellow pigment in their skin, fat, egg yolk, and blood serum. If they are given the pigment in their food, the color is restored, only to disappear if they are deprived of it. Further, Palmer, has shown a remarkable species difference: species with colored fat, such as the cow, horse and hen, carry the pigments in the blood serum; species with colorless fat, such as sheep, swine and goats, do not carry the pigments in the blood serum.

The working hypothesis for the nerve cell was based on these propositions, and verification was first sought in the chicken. Two series were run, the one lacking carotinoid-containing food from birth, the other carotinoid fed. The latter series consisted both of the experimental introduction of carotinoids in previously carotinoid-free chickens and of other carotinoid-fed from birth. In one half of the chickens of both series, the factor of depression by heat, phosphorous, morphine, or a rice flour diet was introduced to cover the side of disease. That is, the vast majority of abnormal and morbid stimuli are essentially depressant.

The results were uncomplicated. Both normal and depressed chickens on any carotinoid diet showed the presence of the characteristic yellow pigment in all types of nerve cells. The carotinoid-free chickens, both normal and depressed, lacked such a pigment in demonstrable amount. The species difference of Palmer was also shown to hold for nerve cells in the constant occurrence in bovines (association with colored fat) as opposed to the constant absence in swine (associated with colorless fat). Man, who is best known to exhibit lipochrome, is also known to carry carotinoids in his blood serum and has colored fat. Finally, the microchemical reactions of the experimentally introduced lipochrome are throughout identical with those of the lipofuscin, fat-

holding, "Abnutzung" or "wear-and-tear" pigment described by others. The microchemistry, while too superficial for independent analysis, is adequate for the demonstration of an identity. The deposition of the lipochrome is exaggerated by depression. This gives a common basis for its well-known increase under various abnormal conditions. The conception of Lubarsch that the fat-holding pigment is a "wear-and-tear" or metabolic pigment therefore falls to the ground with its demonstration as an exogenous and fortuitous pigment. From previous experimental studies on nerve cell pigmentation, it is the melanin which is the true metabolic pigment of the nerve cell. However, it is not a product of normal or hypernormal activity, but its genesis under all conditions, physiological, morbid, or senile, is referable solely to chronic depression. The exploding of the tradition that melanin is a natural constituent of certain nerve cells, such as those of the *substantia nigra* and *locus caeruleus*, further corroborates its normal absence. The nerve cell is not hampered in its normal process by the accumulation of pigment. The melanin is consequently not a "wear-and-tear" pigment in the normal sense. In so far, however, as depression is a component of old age, disease, and abnormal physiological conditions, the conception of Lubarsch may be transferred to its resulting melanin pigment. [Author's abstract.]

Rasmussen, A. T. THE MITOCHONDRIA IN NERVE CELLS DURING HIBERNATION AND INANITION IN THE WOODCHUCK (*Marmota monax*). [Journal of Comparative Neurology, Vol. 31, pp. 37-49, Oct., 1919.]

The marked functional changes taking place during the onset and again at the termination of hibernation in mammals would seem to offer an excellent opportunity for the study of the relationship of various structural elements to cellular activity. Upon this assumption there was made a quantitative determination of the number of mitochondria (chondriosomes) in the principal nerve cells of the woodchuck at three different periods—(1) just before the onset of hibernation, (2) during the latter part of dormancy, and (3) after waking up and becoming active in the spring. No food or water was available either during or subsequent to winter-sleep. In obtaining the tissue, the blood was first washed out by gradual profusion with oxygenated Locke's fluid and numerous short hemorrhages while the animal was still alive. Regaud's neutral formalin and potassium bichromate solution was then allowed to perfuse the entire animal for an hour. After further chromation the tissue was carried into hard paraffin, sections cut 2 and 3 μ thick, and stained in a 20 per cent. solution of acid fuchsin in aniline water and differentiated with a 1 per cent. aq. sol. of methylgreen, as carried out by E. V. Cowdry. The following cells were studied: spinal ganglion cells, motor cells of ventral and lateral horns of spinal cord, cells of nucleus gracilis and of nucleus cuneatus, Purkinje cells of cerebellum,

cells in superior colliculus, Betz cells from motor cortex, and mitral cells of the olfactory bulb.

The results indicate no noticeable difference in number, size, shape or staining reaction of the mitochondria at the three periods selected. The number of mitochondria expressed in millions per cu. mm. of cytoplasm in the eight types of cells examined varied from 186 to 354. The constancy in the number of mitochondria in the cells of a given nucleus corroborates the findings of Thurlow that there is a constant mitochondria-cytoplasmic ratio for each type of nerve cells. This specific maintained by Portier to the effect that mitochondria are organisms living in symbiosis in larger cells. Since the reduction in oxidation processes to one twentieth or even less, which occurs with the onset of hibernation, has no effect on the mitochondria, there is no evidence from this source that these granules are associated with oxidation processes. The tendency toward acidosis, which also occurs during dormancy, evidently is not accompanied by any noticeable alteration in the mitochondrial content of nerve cells. Several weeks of absolute inanition following hibernation did not affect appreciably the mitochondria of nerve cells. [Author's abstract.]

Jacobson, Edmund, REDUCTION OF NERVOUS IRRITABILITY AND EXCITEMENT BY PROGRESSIVE RELAXATION. [Section on Nervous and Mental Diseases, A. M. A. Meeting, New Orleans, 1920.]

Progressive relaxation is a method indirectly suggested by experiments begun in 1908. It is based upon observations of motor activities that accompany mental and emotional excitement. These motor activities evidently are signs or symptoms of overactivity of the cerebrospinal or autonomic apparatus. Clinical as well as experimental observations disclose that as these motor signs subside, the individual becomes less excited and irritable. Motor overactivity commonly called "nervousness" may be reduced by progressive relaxation of the various muscle groups of the body. The clinical method differs from what has hitherto passed as relaxation. The abridged form may be used where relatively quick effects are desired. Technic and cases follow. [Author's abstract.]

Escardo y Anaya, V. EPIDEMIC POLIOMYELITIS IN URUGUAY. [Rev. Med. del Uruguay, Nov., 1919.]

Escardo presented his paper at the recent International Child Congress, commenting particularly on the element of pain which was a feature of the disease during the three epidemics in Uruguay, 1906, 1912 and 1916, and mentioning two unpublished cases of cephaloplegia, like those described by Figueiras at Rio de Janeiro. These were seen ten years ago by de Pena at Montevideo. Probably unrecognized poliomyelitis was responsible for the cephaloplegia. The child was totally unable to hold up its head, and had also a slight tendency to paralysis.

These symptoms subsided in about a week in one case, but the infant of 2 years succumbed to asphyxia. Escardo adds that serotherapy is being tried at Buenos Aires in poliomyelitis, and the results are quite encouraging.

Solares, F. V., and Ayguavives, J. F. POLIOMYELITIS TREATMENT. [Arch. d. Ginecop. Obst. y. Ped., Aug., 1919.]

By waiting for the acute phase to be over and then giving hypodermic injections of strychnin plus application of electricity, Vidal and Ayguavives are able to avert muscle atrophy. The child's susceptibility to strychnin is tested with a preliminary dose of 0.25 mg. This is increased by the same amount until the child is getting 1 mg., which is kept up for five days if no trismus has appeared after the first dose. They give 0.5 mg. and increase in a week to 1.5 mg. at the seventh day. This is kept up for ten days if no signs of intoxication are evident. The drug is suspended for two weeks the twenty-third day but the electric sittings and massage are continued. It is then resumed. Of two cases described, one, a child of 3, is now walking well after 125 injections; the other, not quite 2, shows great tendency to improvement after six months of the faradic current, with subsequent galvanic sittings, and injections of strychnin.

4. MID BRAIN, CEREBELLUM.

Vernet, M. THE SYNDROME OF THE FORAMEN LACERUM POSTERIUS. [Rev. Neurol., November-December, 1918.]

This author records 28 cases of this syndrome which consists of a combined paralysis of the glosso-pharyngeal, pneumogastric and spinal accessory nerves. After discussing the anatomy of the part, he analyses the reasons for the development of the syndrome. Lesion of the glosso-pharyngeal is shown by paralysis of the superior constrictor of the pharynx, causing difficulty in swallowing solids and by deviation of the palate towards the sound side, on phonation. Affection of the sense of taste, on the posterior third of the tongue, homolaterally is also present. Pneumogastric lesion develops a hemipalatal or hemipharyngeal anesthesia, reduction of salivation and dyspnea, pseudo-asthma and cough. Spinal accessory lesions show nasal regurgitation of fluids, hoarseness (impaired movement of vocal cords), acceleration or irregularity of the pulse and paralysis of the sterno-mastoid and trapezius muscles. The most frequent cause is trauma: in some cases, however, and this is very important, local pressure by adenomata, or by some inflammatory condition is the cause, while in others, syphilis is the existing cause.

Sittig, O. A PECULIAR SYNDROME OF THE MEDULLA OBLONGATA AFTER GUNSHOT WOUNDS (MONOPLEGIA SPASTICA SUPERIOR). [Monatschr. f. Psychiat. u. Neurol., 1919, Vol. 46, No. 2, p. 112.]

Gunshot wounds of the medulla oblongata present various disease pictures, but all having certain typical features in common, namely,

those of partial or total transverse lesions at various levels of the spinal column (the Brown-Sequard symptom complex). During the war a new variation of this disease picture was described by Oppenheim to which he gave the name hemiplegia spinalis. The author here adds still another variation observed in a number of cases, seven of which he here describes. This clinical type is characterized by a spastic monoplegia or palsy of one upper extremity. In one case there was further a disturbance of sensibility on the ulnar side of the palsied arm. This syndrome may be developed from various disease pictures, as from a diplegia, hemiplegia or the Brown-Sequard symptom complex, but it may also occur as the primary disturbance. The earlier these cases are examined, the more numerous the symptoms are likely to be. That these are not cases of monoplegia due to lesion of the anterior cornu is sufficiently shown by the behavior of the reflexes (special emphasis may be placed on the presence of the reflexes in the palsied arm) and also by the electrical findings. Cerebral paralysis is also excluded when the path of the projectile is taken into consideration, the paralysis of the four extremities immediately after the injury, and, finally, the disturbances of the Brown-Sequard type. The author ascribes the peculiar clinical picture to a circumscribed necrosis of the medulla oblongata resulting from a transverse lesion in the upper part of the same. For this peculiar syndrome the author suggests the name "monoplegia spinalis spastica superior."

Medea, G. TUBERCULOMA OF THE MID-BRAIN. [Atti Soc. Lomb. Sc. Med. Biol., 1919, viii, p. 112.]

Clinical observation, confirmed by the post-mortem examination, of a case of solitary tuberculoma of the right inferior and superior colliculi, showed hemiparesis of the left side, impossibility of turning upwards both eyeballs (Bruns' symptom), slight paralysis of the oculomotors of both sides and remarkable ataxy of the cerebellar type. Slight troubles of the hearing on the left side were also observed. The author emphasises the importance of Bruns' symptom and of the initial troubles of the oculomotors in the differential diagnosis between tumors of the corpora quadrigemina and of the vermis cerebelli. This, in contradiction to Nothnagel, who lays more stress on the early appearance of cerebellar symptoms followed by troubles of the oculomotors. Medea's case is interesting also because it confirms the existence in the corpora quadrigemina of a special center for the upward and downward movements of the eyeball. Serial section of the mid-brain showed that the tuberculoma had spread to the pedunculus cerebri but without directly affecting the cerebellum. [Da Fano.]

Claude, Henri, and Lhermitte, Jean. WOUNDS OF MEDULLA. [L'Encephale, 1920, Vol. 15, No. 1, p. 1.]

War pathology has shown that after severe vertebral wounds the medulla is affected in various ways but degenerations such as the au-

thors publish have not hitherto been described. In cases observed by them, three of which are here reported, there were softenings of the spinal cord extending far beyond the region directly injured. In the first case a revolver ball penetrated at the level of the costal cartilage of the seventh articulation. The path was clean cut and yet there was myelomalacia of the entire lower half of the medulla. In the second case where there was fracture of the vertebral column, there was softening of all the adjacent parts. In the third case the degeneration was less extended and pronounced and conformed more nearly to what is usually observed as result of rending of vertebral tissue. The first two cases may be interpreted as degeneration of substance at a distance from the focus, but the mechanism of such degenerations is not clear. In the cases under consideration they were certainly not due to infection, and the authors consider they were caused by vascular disintegration combined with necrosis of the primary nervous elements. It is thus shown that the liberation of the spinal axis from compressions only remedies the local injury and that the possibility of these serious distance effects must always be taken into consideration when surgical intervention is resorted to.

Van Schelven. THE TRANSVERSE LESION OF THE MEDULLA OBLONGATA. [Neurol. Centralbl., Jan. 2, 1919, No. 1, Vol. 38.]

The author presents a symptom complex observed by him, following a transverse lesion of the medulla, as the antithesis of the Brown-Sequard syndrome after partial lesion of the medulla in sagittal direction. After a gunshot wound in the back, a paraplegia made its appearance, which gradually disappeared, but so slowly that for two years signs of paralysis were perceptible. At first there were disturbances of bladder and bowels, from which there was complete recovery. The ball penetrated the body to the right of the vertebral column at the ninth rib, touched the arch of the tenth dorsal vertebra, and was healed over in the left side near the spleen. There was anesthesia for sensibility of all qualities in the cutaneous area of the first lumbar segment, on the left side. In the legs the cutaneous sensibility was normal. Beginning with the first lumbar vertebra, deep sensibility in the lower region of the body was profoundly disturbed, as well as sensibility for place and vibration. There were ataxic movements of the legs in walking and when the patient was recumbent, also spastic paraparesis, with clonus and pathological reflexes. From the path of the wound, it may be inferred that the ball grazed the medulla oblongata in a transverse direction, so that the posterior root of the first lumbar vertebra was severed. The spastic paraparesis, with positive Babinski, etc., indicates a pyramidal lesion in the first point of the decussated pyramidal tract in the posterior lateral column. The destruction of deep sensibility is explained by the injury of the posterior columns. The ataxic movements may also be regarded as due to a lesion of the posterior columns. In

the author's case, therefore, there was a wound of the first lumbar segment and the first lumbar root on the left, the posterior columns and the posterior parts of the lateral columns being thereby injured. The integrity of cutaneous sensibility is to be accounted for, on the one hand, by the fact that there are paths for the sensation of touch in the anterior as well as in the posterior columns, and, on the other, by the fact that the paths for pain, heat and cold are in the anterior part of the lateral columns. This syndrome, paraparesis with destruction of deep sensibility and with ataxia, must, in the opinion of the author, be typical for a transverse posterior lesion of the medulla oblongata, just as the Brown-Sequard lesion is for the sagittal lesion.

Crookshank, F. G. HISTORY OF EPIDEMIC ENCEPHALOMYELITIS. [Bost. Med. and Surg. J1., Jan. 8, 1920.]

For some 450 years clinical happenings of a nature now ascribed to encephalomyelitis, or encephalomyelomeningitis, have been recorded, so this author says. These occurrences have been noted as incidental to major epidemics, known historically as sweating sicknesses, epidemic catarrh, or influenzas. Special prevalences have also been described as manifestations of special diseases. These have usually appeared shortly before or shortly after major "influenzal" epidemics, or else in geographical proximity to endemic-epidemic and endemic-influenzal prevalences. Epidemic encephalomyelomeningitis represents an intensive and specialized reaction that has the same epidemiologic relation to pandemic influenza as have the prevalences and epidemics of "septic" pneumonia, of gastro-intestinal illness, and of other maladies described as occurring before and after the wide diffusions generally referred to as pandemic influenza.

Marie, Pierre, and Mestrezat. LETHARGIC ENCEPHALITIS AND CEREBROSPINAL FLUID. [Bulletin de l'Académie de médecine, February 3, 1920.]

These authors dwell on the importance diagnostically of meningeal reactions in lethargic encephalitis. Although Achard, Netter, and Widai have reported instances of unexpectedly marked evidences of such a reaction in the cerebrospinal fluid, the disease is *not* a meningitis, and frequently entails no pronounced meningeal reaction. In six cases with the Nageotte counting chamber, Marie found thirteen, eight, 10.5, twelve, twenty-six and twenty-four lymphocytes respectively in the cerebrospinal fluid; these figures manifestly imply only a very moderate lymphocytosis. The albumin, measured in two instances with the Sicard tube, was 0.25 and 0.55 gram, and estimated in four instances by the opacity index, was 0.25, 0.55, and 0.65, and 0.14. These figures, although denoting increased albumin, do not approach those obtained in meningitis, and it is well known that an albumin increase may occur

independently of any meningitis. In the sixth case detailed chemical studies were made, showing but little change from normal cerebro-spinal fluid. Conditions as regards albumin, fibrinogen, chlorides, dry extract, and ash were practically normal, while urea and sugar were definitely increased and acetone present in small amount. Comparison of these results with those obtained in tuberculous meningitis, or different forms of acute meningitis, shows marked discrepancies which are of diagnostic import. In the sixth case of encephalitis the fluid was clear, sugar somewhat increased, albumin, chlorides, extract, and ash normal. On the other hand, in meningitis cases, the fluid is usually more or less turbid, albumin greatly increased, chlorides greatly diminished, sugar absent or greatly diminished, extract increased in non-tuberculous forms of meningitis, and ash diminished in tuberculous meningitis. Lethargic encephalitis is not excluded by a moderate meningeal reaction in a patient with encephalomeningeal symptoms. Should a marked reaction occur, the clinician should be on his guard not to mistake a true meningitis for lethargic encephalitis—a diagnostic error now being frequently committed.

5. BRAIN: MENINGES.

van Valkenburg, C. T. MENINGITIS CIRCUMSCRIPTA, ITS DIAGNOSIS AND SURGICAL TREATMENT. [*Nederl. Tydschrift voor Geneeskunde*, 1915, No. 24.]

The author had four cases: one of dural cicatrice, three of leptomeningitis circumscripta. There is a description of neurological and surgical peculiarities, including a crossed frontal reflex in the leg; tonic supination of the foot and tonic extension of the hallux on rubbing the lateral surface of the other leg, or pinching the contralateral thigh. He warns against ligatures of veins; the common surgical tendency to have a bloodless field may often cause irreparable loss of functions by extensive softening. [Author's abstract.]

Waterhouse, Rupert. MENINGITIS TREATED BY INTRATHECAL INJECTIONS OF THE PATIENT'S BLOOD SERUM. [*British Medical Journal*, Jan. 10, 1920.]

Since all evidence goes to show that cerebro-spinal fever begins as a septicemia, but, owing to the production of antibodies, the blood in the majority of cases soon becomes unsuitable as a habitat for the microörganism, whilst, in the cerebro-spinal fluid which such antibodies reach with difficulty it will continue to flourish, it seems reasonable in cases such as the following where the exact group to which the infecting germ belongs cannot be determined, to inject the patient's own blood serum into the cerebro-spinal space in the hope that antibodies may be present in sufficient quantity favorably to influence the infection of the meninges. The only other active treatment adopted in the following case was the administration of ten grains of helmitol four-hourly.

A man aged 30 whose previous health had been good was taken ill May 30, 1919, with shivering, severe headache and photophobia followed in a few days by stiffness of the neck and herpes labialis. On the eighth day the cerebro-spinal fluid was found to be under increased pressure, turbid, containing 3,000 leucocytes (91 per cent. polymorphonuclear) per c.m.m. and clotting on standing. No microorganisms in smears or on culture. At this time there was retraction of the head and Kernig's sign was present. There was delirium at night and rapid loss of flesh. On the eleventh day, 50 c.c. of the patient's blood serum (removed from a vein in the arm the previous day) were injected by lumbar puncture into the subarachnoid space after removal of an equal quantity of cerebro-spinal fluid: on each of the twelfth, thirteenth and fourteenth days 12 c.c. were so injected and on the sixteenth day 5 c.c. Improvement in the symptoms set in coincidently with the giving of the injections. The temperature, which after the first week had ranged between 100 and 102 degrees, fell to normal on the twentieth day. Convalescence was rapid, and, on August 3, the man was discharged from hospital: he resumed work in September and has since remained perfectly well. [Author's abstract.]

Dana, H. W. THE DIAGNOSIS OF MENINGITIS. [Boston Med. and Surg. Jour., Jan. 22, 1920.]

This writer discusses a series of cases either of atypical meningitis or of cases with meningeal symptoms, and full case reports of five cases, including autopsy findings in two, are given. One case showed all symptoms and signs of a tuberculous meningitis with a high cell count of mononuclear cells in the spinal fluid. Lumbar puncture, repeated once ten days later, removed all symptoms for some weeks, the patient being discharged as well, with a diagnosis of serous meningitis. He died a month later of tuberculous meningitis. Another case showed an apparent tuberculous meningitis, in which the removal of a plaster cast worn on account of a dorsal Pott's disease, caused the disappearance—at least, for some months—of all symptoms of meningitis. The third case, admitted to hospital twice, was that of a patient with a psoas abscess, unrecognized for several weeks, and after discharge, returning to hospital to die from the invasion of the spinal canal by the tuberculous process. The next case showed a pneumococcus meningitis at autopsy, she having been admitted as having septic sore throat, and because of the pushing forward into the throat, of the bodies of the cervical vertebræ, it was thought she had a retropharyngeal abscess. Later, when this mass in the throat was found to be as hard as bone, it was considered that there was a tumor of the vertebræ present. Retraction of the neck appeared later. No disease of the spine was found post-mortem. The last case showed rigidity and tenderness of the neck, with a Babinski reflex on one side, and spinal fluid under light pressure. The final diagnosis was cerebral and acromegaly. [Author's abstract.]

Bonaba, J. MENINGEAL REACTION IN MUMPS. [*Archivos Latino-Americanos de Pediatria*, Mar.-Apr., 1919.]

The author describes a case of meningeal reaction in mumps, in a boy of 9 who had been ill with mumps for a week and who entered the hospital with a characteristic meninges picture: headache, vomiting, constipation, slight rigidity of the neck, Kernig's sign, general depression. On lumbar puncture, a clear liquid flowed out a drop at a time, and contained 91 lymphocytes per cubic millimeter. The progress of the case was favorable; three days later vomiting and the rigidity of the neck had disappeared; the constipation and the meningeal streak still persisted. Lumbar puncture gave a clear liquid containing 39 lymphocytes per cubic millimeter. The skin reaction was positive. A puncture made five days after the last resulted in a liquid containing 37 lymphocytes per cubic millimeter. The boy was dismissed as cured after having been in hospital 27 days. A lumbar puncture made the day of his dismissal gave a normal liquid.

A summary is given of the meningeal reactions in mumps. These are usually transitory, of benign prognosis; in them there was not observed the tendency, so marked in certain forms of meningitis, of somnolence and coma. He notes that in other cases the diagnosis may be difficult because the parotid tumefaction is so slight that it is scarcely perceptible or may be completely lacking as in a patient of Dr. Garzon's. The writer then goes on to study the characteristics of the cerebrospinal fluid, which presents a large increase in cellular elements; total disappearance of lymphocytes. In Massary's opinion the cytologic reaction would be constant in mumps, even in cases where no meningeal signs were observed. To confirm this the author studied the liquid in several children who had mumps without meningeal symptoms. He often found a cytologic reaction (from 20 to 300 cells) but it failed him in three authentic cases in which several punctures were made in succession. [Author's abstract.]

Paetsch. A PECULIAR EPIDEMIC OF MENINGITIS. [*Deut. med. Woch.*, 1919, No. 44.]

The author gives a report of a meningitis epidemic observed in a German battalion at the front in the spring of 1916 in Kurland. Meningococcus meningitis at that time occurred only sporadically among civilians and soldiers. The illness set in with cough and a cold in the head, headache after two or three days, stiffness of the neck, at times nausea. Usually several inhabitants of the same hut fell ill in rapid succession. Clinical reports showed temperatures from 37-38° C., fatigue, opisthotonos, Kernig's sign from time to time, slight increase in pressure on lumbar puncture, slight increase in cells in the spinal fluid which was entirely clear. Lumbar puncture had a good effect upon the patient. The fluid was bacteriologically always negative both in smears

and cultures. The length of the illness was from 3 to 5 days, usually terminating in recovery. On one occasion paralysis of the ocular muscles was noted for two days, one patient died. On section no pathological autopsy findings were observable except a slightly murky swelling of the pia; the bacteriological examination was also negative. The spreading of the disease was almost certainly brought about by droplet infection, since men lying next to each other usually came down with it. Catarrh of the upper air passages acted as a predisposing element. The epidemic died down at once when the troops were withdrawn from the front line and the catarrhal infection ceased. The etiology could not be worked out. [Author's abstract.]

Blackfan, K. D. HYDROCEPHALUS IN MENINGITIS. [Amer. Jour. Dis. of Children, Dec., 1919.]

In twenty-five cases of meningitis in which hydrocephalus had developed Blackfan carried out the phenolsulphonephthalein test and had X-ray pictures made after the injection of the ventricles with air. Seventeen cases were caused by the meningococcus. Communicating hydrocephalus developed in eight, and the obstructive form in nine. Ten of the seventeen died. Two of the seven who recovered had an obstructive hydrocephalus but quick improvement followed after the introduction of antimeningococcus serum into the ventricles. In four cases in which a communicating hydrocephalus was present, the process became arrested after treatment. Uneventful recovery followed. One patient developed a chronic hydrocephalus (communicating). A ventriculogram showed almost complete destruction of the cortex. In the ten fatal cases, the necropsy confirmed the clinical diagnosis by demonstration of the exciting cause of the hydrocephalus. In seven of obstructive hydrocephalus an exudate occluded the foramina at the base of the brain, and in three of communicating hydrocephalus the basal cisternæ were totally obliterated by a thick purulent exudate.

6. BRAIN.

Kaufmann, K. AN UNUSUAL CASE OF BRAIN TUMOR. [Neurol. Centralbl., June 1, 1918, No. 11, Vol. 37.]

Although every case of brain tumor is interesting to the profession, the author considers the case he here presents of especial interest, because, on the one hand, it deviates in many points from the usual symptom complex and, on the other, its localization in the two hemispheres of the brain is peculiar. At the section there was found, in the medullary layer of the right hemisphere of the cerebrum, a sharply defined, tightly stretched grayish-red neoplasm, slightly sunken in the center but otherwise pushing forth prominently. In it were found rather numerous blood vessels and scattered turbid necrotic places; it measured 8 cm. from the front backwards and from above to below, 4 cm. Beginning

in the front at the level of the parieto-occipital fissure it approached the cortex and finally replaced an extensive area of the cortex of the occipital lobe up to the apex. The precuneus was unaffected, but the cortex of the cuneus and of the gyrus lingualis was infiltrated with new growths; the region on the lateral convexity behind the parieto-occipital fissure was unchanged (visual perception, mind blindness). In the medullary layer of the right gyrus supramarginalis was a metastatic knot, the size of a hazelnut, which touched the pia at its tip. The medullary layer, anteriorly from the neoplasm, was soaked for some distance with edematous substance. In the left hemisphere there was also a neoplasm of greater age which extended to the ependyma of the anterior cornu on the one hand and, on the other, reached the pia of a circumscribed area of the temporal lobe. This tumor measured backwards 6 cm. and across 1.5 cm. It was for the most part sunken in and of grayish yellow color. The lateral convexity and the cuneus were unaffected, but on the other hand the neoplasm reached the medulla of the gyrus lingualis and at certain points replaced the deeper cortex parts of the same. The microscopic examination showed the growth to be a round cell sarcoma. The tumor in the left occipital lobe is to be regarded as the original growth and that in the right should be understood as a metastasis. The site of the original tumor was in the brain substance itself, and it found an outlet in the medullary substance. The clinical features presented by this case are remarkable in several respects. In the literature numerous cases of tumor which remained latent until death are found, but in the author's case when the size of the tumor in both hemispheres is taken into consideration it seems very strange that there were so few symptoms indicating the nature of the disturbance. In fact from the symptoms manifested it was impossible to make the so-called diagnosis of localization until a short time before death. The unfailing symptom of headache was not pronounced and was not localized in a definite place. There was no vertigo. The symptom which is the next in frequency and importance to headache, *i.e.*, choked disk was wholly absent at first. According to Oppenheim this symptom is observed in 90 per cent. of cases of brain tumor. There was atrophy of the optic nerve which is sometimes a symptom of brain tumor though a relatively rare one. In the author's case it was fully explained, by the post-mortem findings, as a degeneration of the fibers of the optic nerve due to the sarcoma in the occipital lobe. Up to a few weeks before death there were not signs of choked disk and the diagnosis of tumor cerebri could not be made until fourteen days before exitus. The explanation of the long absence of symptoms of tumor may be found in the fact that the sarcoma, especially in the occipital lobe was subject to many regressions in its progressive course; growth and reabsorption were in equilibrium until finally the neoplasm combined with the secondary edema and the hydrocephalus internus overbalanced the reabsorption tendencies. The diagnosis was further rendered difficult by the

absence of symptoms indicating the situation of the tumor. The characteristic symptom of disease of the cortex of the cuneus and of the gyrus lingualis is a crossed homonymous hemianopsia. That this symptom was present is explained by the fact that there were tumors almost symmetrically localized in the two hemispheres, which to a certain extent would efface any unilateral limitation of the field of vision. A short time before death there was ataxia of the limbs which permitted the assumption of an injury of the cerebellum. As the section showed there was pressure on the cerebellum from the growths in the two hemispheres—a possibility referred to in the literature, by Oppenheim and others. When the left occipital lobe is affected the fact usually becomes manifest in disturbances of speech (aphasia), but in the author's case no aphasic symptoms were observed. There was no mind blindness, which is the usual symptom when both occipital lobes are affected. There were also no hallucinations and no evidence of disorientation.

7. NEUROSYPHILIS.

Solomon, H. C. AGREEMENT IN RESULTS OF THE WASSERMANN REACTION. [Jour. A. M. A., Mar. 20, 1920.]

The blood serums of 3,000 patients were subjected to the Wassermann tests by two independent laboratories and showed a complete uniformity in the findings of the two laboratories in 93.44 per cent. The 6.56 per cent. variation included cases reported as doubtful. Considering only the variation of cases reported positive by one laboratory and negative by the other the percentage variation was 4. This was 1.4 per cent. positive in one laboratory and 2.6 per cent. positive by the other laboratory. Some of the cases reported positive by one laboratory and negative by the other were known to be syphilitic, so that the negative reaction was the incorrect one. Considering then, the cases that either laboratory may have reported as positive in nonsyphilitic cases, the percentage was 3.16. This is probably a higher percentage for false positives than actually occurred, as some of these cases were presumably syphilitic. This percentage variation is based on only one test. Repetitions resulted in a uniformity of findings in the majority of cases. This is considered a good testimonial for the accuracy of the tests as performed in these two laboratories.

Wolbarst, A. L. WASSERMANN CONTRADICTIONS CONSIDERED FROM THE CLINICIAN'S POINT OF VIEW. [N. Y. Medical Journal, January 31, 1920.]

In a rather exhaustive study covering 271 cases the author discusses the contradictory reports of serologists on the Wassermann reaction. He invariably draws blood for the test into three test tubes and has them worked independently by three serologists. These serologists are chosen according to their conception of what the Wassermann stands

for in its relation to the diagnosis of syphilis. The first serologist believes that it is his duty to uncover every suspicious case of syphilis; he makes his reagents so sensitive that there is no possibility of the slightest positive reaction escaping him. He would rather get a positive reaction on a non-luetic than to have a weakly luetic escape with a doubtful or negative Wassermann reaction. The result is that this serologist obtains far more positive reactions than others do. The second serologist believes that the Wassermann reaction should protect the patient against a wrong diagnosis of lues. Hence he requires a strongly positive reaction before he considers the patient Wassermann positive. He obtains comparatively few positive reactions, in consequence. He would have the weakly positive luetic escape rather than convict a non-luetic. The third serologist runs a commercial laboratory and occupies a "middle of the road" position, and in consequence his results reflect this tendency. In 219 cases worked by three serologists, Wolbarst found these different results: Serologist A found 93 positives (43 per cent.) and 125 negatives (57 per cent.); serologist B found 104 positives (48 per cent.) and 115 negatives (52 per cent.); serologist C obtained 121 positives (55 per cent.) and 98 negatives (45 per cent.). It is thus evident that the character of a Wassermann report will depend very largely on the personality and technic of the serologist. The writer adopted the same method of study in 33 cases, in which the blood was tested for complement fixation for gonorrhea. Here too, distinct contradictions were found.

The author concludes: The Wassermann test and the complement fixation test for gonorrhea should be made by at least three serologists working independently; the serum should be taken simultaneously and sent to the different laboratories under identical conditions; one serologist is not to be depended on, however capable he may be. Three serologists will agree in approximately 53 per cent. of Wassermann tests and approximately 42 per cent. of gonorrhea fixation tests. That is, the chances are about 53 in 100 that three serologists will agree on any given serum. Curiously enough they are more likely to agree, when they do agree, in the negative cases than in the positive cases. At all events, in view of these contradictions and uncertainties, it is well to devote more study to the clinical features of our cases and trust not quite so implicitly on our laboratory workers for our diagnosis. [Author's abstract.]

Warwick, M., and Nixon, F. THE COLLOIDAL GOLD REACTION AND ITS CLINICAL INTERPRETATION. [Arch. of Int. Med., Feb., 1920.]

This study is based upon observation of over 800 spinal fluids from 408 patients in a general teaching hospital. The authors give a comprehensive review of the voluminous literature upon the subject and a detailed description of the technique of the globulin reaction, cell count

and the preparation of the colloidal gold in which they feel proper neutrality is the key to a successful solution. In their normal spinal fluids they find an average cell count of 1.6, and from the literature as well as their own observations they consider any count over 5 as pathological.

In paresis they found a typical curve in 94.5 per cent.; in tabes dorsalis typical curves in 74.3 per cent. and atypical ones in 4 per cent.; in cerebrospinal syphilis typical results in 77.79 per cent. and slight curves in 7.4 per cent. and in meningitis typical curves in 83 per cent. In multiple sclerosis marked curves were found in 45 per cent. and slight ones in 10 per cent. Because of this fact they feel with Felton and Maxy that since these zones or curves are not absolutely specific they should be designated by the Roman numerals, I, II, and III instead of "paretic," "syphilitic" and "meningitic," respectively.

In their large series of miscellaneous cases out of 240 only 17 curves were obtained and many of these were slight or atypical. In a series of 14 cases of brain or cord tumors or myelitis, each verified by operation or necropsy, 8 showed a curve in Zone III, accompanied by a negative or faintly positive globulin and a normal cell count, thus easily differentiating it from the "meningitic" reaction which is accompanied by a strongly positive globulin and very high cell count. The authors feel that these findings are of great value from a diagnostic point of view.

In the series of treated cases a curve sometimes appeared after treatment was begun, thus simulating a "provocative" reaction. After treatment the curve sometimes remained unchanged and sometimes disappeared or became atypical and did not in any way parallel the clinical course or improvement.

In many apparently early cases the colloidal gold curve was the only one of the spinal fluid reactions to be positive, showing it to be the most delicate and of the greatest value in the early diagnosis of neurosyphilis. On the other hand in a few cases of well-developed neurosyphilis the colloidal gold curve as well as the other spinal fluid reactions were negative.

The authors feel that, with the improved technique and proper attention to neutrality, satisfactory colloidal gold solutions are within the reach of every laboratory worker and that fact, as well as its very obvious importance should make it a part of every spinal fluid analysis and complete neurological examination, especially in all cases of general syphilis. They conclude therefore that this reaction is the most delicate and is of independent value but, on the other hand, does not replace any of the others. [Author's abstract.]

Bloch, M. SYPHILITIC MENINGITIS. [*Médecine*, Nov., 1919.]

Bloch argues that "neurorecurrences" and "meningorelapses" are in reality the flarings up of an inadequately treated meningovascularitis.

When the Wassermann reaction persists positive after vigorous treatment, the possibility of this must be borne in mind. Local intraspinal medication has given good results.

Kyrle, J., Brandt, R., and Mras, F. THE COLLOIDAL GOLD TEST IN THE CEREBRO-SPINAL FLUID IN SYPHILIS. [Wien. klin. Woch., January 1, 1920.]

As the result of the study of Lange's colloid gold test in 720 cases of syphilis in all stages of the disease these authors came to the following conclusions: (1) The reaction is quite independent of the albumin-globulin test and the Wassermann reaction in the cerebro-spinal fluid, though it is often associated with them. (2) It is specific in so far as it is not so pronounced in other diseases as in syphilis with the exception of disseminated sclerosis. (3) It is much less likely than other tests, such as the Wassermann reaction, to fail or yield doubtful results. (4) A positive test indicates a considerable change in the cerebro-spinal fluid, even if this is not shown by other reactions.

Kafka, V. CONCERNING THE COLLOID REACTIONS OF THE SPINAL FLUID. [Archiv f. Psych., 1919, Vol. 59, p. 681.]

To assure the proper technique for the colloid reaction it is necessary to be certain of the proper electrolytic concentration. Each colloid solution has peculiarities of its own, a special sensitiveness to the salt solution. In order to measure this sensitiveness preliminary tests with the salt solution should be undertaken, not only for the mastix but for the gold solution. Only then can specific results be obtained which permit comparison with other results. The salt solution test is not necessary for the Berlin blue solution, because the sensitiveness of this preparation (without the addition of the liquor) is very slight. But as the colloid sensitiveness of the solution is very great and as this is increased up to a certain degree with increased salt concentration, it is advisable to use distilled water for diluting purposes. The Berlin blue reaction is technically the simplest but does not show details as do other reactions. The theory of the colloidal spinal fluid reactions is still far from being clear.

Book Reviews

Coriat, Isador H. *THE HYSTERIA OF LADY MACBETH.* New York, Moffat, Yard and Company, 1912.

Shakespeare possessed, as the writer of this little book reminds us, a "remarkable insight into mental mechanisms, particularly into abnormal states of unconsciousness." This study aims to examine some of these and thus receive from the artist's power further understanding of these same pathological mechanisms which have continually to be met in everyday psychiatric situations. Coriat therefore gives first a brief review of the theories of modern analytical psychology and then of the principles of psychic causation which it discovers at work and upon which it bases its analysis. Not only are mental states never at rest, giving thereby an unbroken chain of cause and effect or of mental determinism, but certain special factors interfere with the smooth and harmonious working out of this causal process. Among these are repression, which enters to force back the wish energy into the unconscious, substitution, which changes this wish force into a different content, and a further repression which again prevents the repressed complex from entering consciousness and after which it may be further dissociated from the rest of the personality. Then it may return in its dissociated form and indirectly and symbolically repeat the content of the repressed material.

The somnambulistic attack is one typical form of the return of this material, studied, as the author states, in some detail by the French school of neurology. It is this which Shakespeare has most skillfully used to reveal the psychic conflict of Lady Macbeth. According to Coriat's analysis, she is the victim of a transformation of her sexual desire, represented by her childlessness, over into ambition. Her natural cowardice is also suppressed and substituted by an assumed bravery, but it is the content of such suppression of cowardice as well as of her knowledge of the murders which later bursts forth in the repeated somnambulistic activity. In this in typical fashion the content of the repressed material is reproduced.

This is a suggestive analysis as far as it goes. A true psychoanalysis of this striking character and its masterly treatment ought however to discover much more. In fact Coriat leads the reader to expect more but leaves him with an unsatisfied sense of incompleteness and unconvincingness. Suppression and repression involve more numerous elements the search for which leads deeper into character than Coriat

has gone. Even in a fictitious character the chain of causation and determinism has to be sought in more fundamental experiences and wishes. Why for example should it have been necessary to have excluded the presence of a father complex? Hysteria is not produced merely from such simple and individual elements. Whether there is one particular precipitating cause for the appearance of the hysterical outburst, psychoanalysis discovers the reaction to be a wider one which pervades the whole character and includes many factors interwoven in its expression. Such indeed would be discovered to be present through a more complete analysis of this famous somnambulistic scene and of the whole action of Lady Macbeth in the drama. Much of this has been suggested, as has been said, but not carried out in this study. The writer seems also to have allowed himself some confusion in statement which makes for lack of psychological clearness. His words seem to make of hysteria a cause rather than a symptomatic manifestation or group of manifestations of underlying causes belonging in the psychic character and its history.

Blanchard, Phyllis. *THE ADOLESCENT GIRL. A STUDY FROM THE PSYCHOANALYTIC VIEWPOINT.* With a Preface by Dr. G. Stanley Hall. New York, Moffatt, Yard and Company, 1920.

The mystery of the feminine psychic nature, mystery to the woman herself as much as to the world about her, has perhaps been the strongest reason why her psychology has received but little attempt at thorough study. This has been particularly true in regard to the psychology of feminine adolescence, where the mystery lies greatest. This makes of this present work a most important contribution to present-day scientific psychological investigation. It helps to bring this elusive subject into that clear light of science, which the author reminds us is a product only of most recent years. She reviews briefly the vagueness of worship or of fear with which female adolescence has been surrounded through the history of man. She recognizes also that the clearer approach to the subject is made because gradually the evolutionary conception of development has been worked out through philosophical thought and has then been clarified through the psychic discoveries and theories of Freud and his numerous followers. Each one of these has contributed some special phase or viewpoint to this wider survey and deeper investigation of human psychology.

The author traces the growth and unfolding of the sexual and maternal instincts of the girl with special emphasis upon the overmanifestation or peculiarity of expression of any part of these instincts which takes possession of the adolescent girl as she faces her entrance into an adult life endowed with all her awakening power. She calls special attention to the unmistakably frequent sex content of the dreams at this period of life. The presence of the sex impulse is consciously admitted, as certain personal histories testify, but this tends to pass over

into other forms of emotion as well as to reinforce all other emotions. The external manifestation of this transformation into other emotions may be that of shyness and fear or the opposite of these, a boldness and wayward exhibitionism. The adolescent girl is subject to a similar bipolarity of all emotional expression. This lies also in her particular form of struggle between the individual will to power and her deeply laid psychic instincts for racial service. The surrender to these deeper instincts is delayed or even rendered impossible by the interference of the egoistic forces.

The writer discusses the meaning and place of the sexual libido, the prominence of this in man as compared with other animals, its repression through religious and social factors and its finding of sublimation channels. The development of this sublimation is of greatest importance in solving the conflicts which arise in the adolescent life. Without a healthful growth into such sublimation the adolescent girl is the prey to pathological manifestations, hysteria, a "conversion downwards" of the libido, or a turning of it into criminal and delinquent acts. The instability of the adolescent period makes the girl susceptible to such pathological development.

Dr. Blanchard then turns to a consideration of the healthful development of the erotic tendencies, the libido expression, into a normal love. Her chapters on the building up of the complete and healthy love life in its relation to the larger racial life, both in the woman's reproductive function and in the extension of her influence into society, are among the best in the book. She expresses clearly and forcefully the relation of the individual love of man and woman toward society in its out-building and larger satisfaction through this greater extension of itself, its realization of a larger dynamism even than that involved in the individual creation of new beings. The author presents further a view of woman's coming social position in the activities of society from this aspect of wider service based upon her own distinct biological and psychical position which gives to her a no less function than that of man but one of a different nature. This gives a more profound and therefore more sure and lasting basis for a true feminist movement into the future.

The book enters a field where physician, parent, teacher, and most of all the young woman herself needs enlightenment and stimulus. The introduction of much material of racially historical setting for the problem of the adolescent girl makes interesting reading. It disturbs however to some extent the practical directness of a book of this sort. The rather too abundant introduction of such material keeps the book a little above the heads of any but the reader of specialized interest. The reader is also somewhat disturbed by a too slavish dependence upon authorities, one which the author proves her own ability does not need. Beside she defines too separately the various contributions. She might have comprehended more completely the unifying concept to which all

her authorities contributed and given it to her readers more synthetically. The book however will have a welcome place among vital progressive psychological studies.

Scripture, May Kirk, and Jackson, Eugene. *MANUAL OF EXERCISES FOR THE CORRECTION OF SPEECH DISORDERS.* F. A. Davis, Philadelphia, 1919.

The *Manual of Exercises for the Correction of Speech Disorders* by May Kirk Scripture and Eugene Jackson is among the remarkable books of 1919, and is a distinct contribution to the literature of speech correction. The volume is the result of years of experience with patients at the Vanderbilt Clinic where speech work is a part of the neurological department, and where every facility has been allowed the authors for scientific experimentation and practical work for disorders of speech. The method of proceeding is more along psychological lines than physiological. Fifty chapters are presented for use in speech classes, teaching breath control, vowel lengthening, light attack on vowels, rhythm, special helps for starting a sentence, special helps for slowness, diction and speaking, vowel drills and consonant drills, consonant attack, speech building, clear and slow articulation, phrase linking, the octave twist, and sentences for special consonant combinations. There is a lesson on the distinction between sounds resembling each other and excellent material for inflection, melodious speaking, and rhythmic reading. In fact, the whole book leads to expression in the best and most advanced sense of the term. The lay mind may need an explanation of *octave twist* and *consonant attack*, but will agree at once with the plan of the book which is to coördinate breathing, phonation, articulation and thinking. Relaxation is defined as a peaceful change from the tense, constrained, nervous condition of the stutterer. Through relaxation exercises a conscious control is to be gained which will dispell stage fright and bring about a distinct, free controlled utterance that characterizes the speech of the normal, cultured person. The inextricable combination of the mental and the physical is most subtly recognized in the breathing exercises which are calculated to develop not deep breathing, but artistic breathing, and should be so used as to develop a physical coördination that will permit of simple and complex mental processes being performed without effort. The growth and progress of intellectual control gained by the right use of relaxation, breathing, mouth gymnastics and thinking exercises stands for poise.

The dominant note of the manual is character building. The speech defective must be taught how to overcome his selfconsciousness; how to strengthen his will to power; how to face the problems of life anew; how to concentrate upon one point at a time, and to do that manfully and with determination. He must get rid of his fear by putting some-

thing helpful in its place. With this end in view confidence exercises are introduced to develop thinking and spontaneous speech in which the stutterer usually has difficulty.

There is much in the manual that is helpful to those who have no speech defect, and the book can well be used to promote better speech among those who are so fortunate as to have normal speech. The exercises should, however, be used by a trained person who is conversant with the psychological as well as the mechanical aspects of speech correction. The book has many illustrations and a description of the sounds used in English so that the kinesthetic image may be taught where it is lacking.

B. W. REYNOLDS.

Obituary

HENRY MARTYN BANNISTER

The death of Henry Martyn Bannister on May 1, 1920, marked the close of a life of ceaseless activity even though fourteen years of invalidism had preceded the end. He was born in Cazenovia, New York, the son of a clergyman, July 25, 1844. He graduated



HENRY MARTYN BANNISTER

from the Northwestern University in 1863 and took part in the geological survey of Illinois in 1867-8. In 1869 he took his A.M. degree at Northwestern University. Two years later he took his medical degree at the National Medical College, Washington, D. C. He began his medical practice in Chicago in 1874 after having visited Alaska in 1872 as one of its early investigators with the United States geological survey of Territories.

Eleven years of his active practice were spent at the Kankakee State Hospital as assistant superintendent. For many years he had been a sufferer from anhrithis deformans and although for the past fourteen years confined to his home at Evanston, Illinois, and unable to walk, he continued the medical literary work in which he had always been engaged. At the very beginning of his medical career in 1874 he became known in the field of neurological and psychiatrical literature, for with Dr. J. S. Jewell he founded and edited the *Journal of Nervous and Medical Disease*, continuing in the position of editor for seven years. He has also been associated with several other medical journals, particularly for many years serving on the editorial staff of the *Journal of the American Medical Association*, a position he held until his death. This literary work was kept up to the last, for in spite of his physical helplessness he carried it on through dictation as he sat in his chair. Beside his journalistic work, and the publication of many articles, chiefly upon neurological and psychiatrical subjects, as well as his earlier editorial duties, he was the author of a number of larger works. He published with Dr. D. R. Brower "A Practical Manual of Insanity" and contributed chapters to Hare's "System of Therapeutics" and to the "Reference Handbook of Medical Sciences." He contributed also to geological reports.

He was a man of most upright and honest character, a man of warm friendship and of a cheerful, active interest in the affairs of the world. His forced retirement from active life did not impair this interest, but he maintained through reading and discussion as well as through his own writing an active participation in the subjects which interested him. He was a member of the American Medical Association, of the American Medico-Psychological Association and an associate member of the American Neurological Association.

SMITH ELY JELLIFFE.

WILLIAM POLLOCK CRUMBACKER.

On May 14, 1920, death removed a physician who was giving effective though quiet and unobtrusive service in the field of nervous and mental diseases. He was a man of broad sympathies, sterling character and an interest in his work and a knowledge of its requirements which had been gained through a steady course of alternate study and work throughout his life. He was born in

Wheeling, West Virginia, in 1857, his father being also a physician. He received his earliest education in village schools and then in an academy in Philadelphia. He taught school at an early age, attending upon his studies in alternate seasons. In 1878 he entered the Medical College of Ohio, which is now the medical department of the University of Cincinnati, and received his degree in medicine in 1882. Some years later he spent some time in post-graduate work at the Polyclinic Hospital in New York. He had followed in his reading and study the subject of nervous and mental diseases and had been engaged in their practice. In 1897 he spent a year visiting hospitals in Dublin, Ireland, and Edinburgh, Scotland, in order to study these branches specially.

His practice had been begun with his father but he had soon entered the hospital at Athens, Ohio, where he remained five years as assistant physician. After another period of private practice he assumed the position of superintendent of the same hospital, where he remained three years. After this he was in charge of the West Virginia state hospital for the insane for five years. After further private practice he was called to be superintendent of the State Hospital at Independence, Iowa, which position he held from July, 1912, until his death. All his work was done in a spirit of understanding and sympathy and he introduced many radical changes representative of this spirit and of modern progress in the care of the insane. He removed mechanical restraint, admitted female nurses to the male wards, and generally instituted a most helpful attitude toward mental diseases. Under his supervision the hospital has been enlarged, a new psychopathic hospital being among the additions.

He was a member of the Iowa State Medical Association, president of the Buchanan County Medical Society and a member of the American Medico-Psychological Association.

SMITH ELY JELLIFFE.

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Original Articles

PARANOID MANIA

BY LAWSON G. LOWREY, A.M., M.D.

CHIEF MEDICAL OFFICER, PSYCHOPATHIC DEPARTMENT, BOSTON STATE HOSPITAL;
INSTRUCTOR IN NEUROPATHOLOGY AND IN PSYCHIATRY, HARVARD
MEDICAL SCHOOL

Paranoid reactions are sufficiently common in the depressed phases of manic depressive psychosis to be well recognized as distinctive problems in differential diagnosis. When one sees a patient showing depression, hallucinations, and persecutory delusions, the differentiation of manic depressive psychosis, alcoholic hallucinosis, and dementia præcox or a paranoic state is very difficult, and calls for the utmost exactitude in history and examination. While not matters of everyday experience, such states are encountered frequently enough to be within the purview of all.

On the other hand, well-developed paranoid states in association with the manic phases of manic depressive psychosis are rare—so rare indeed that only three typical cases have been seen in three years at this department. I am not referring to the frequently occurring, mildly paranoid attitude of the hypomanic, a compound of egoism, irritability and excitement, and giving rise to outbursts against those who detain the patient, or who, it is fancied, slight them. Such conditions are indeed very common, and represent the effects of the patient's lack of insight at the time. Occasionally, too, violent hatreds engendered during the period of active psychosis are carried over into the period of recovery; but since hatred has not yet ceased to be a part of human emotional equipment, this is not to be regarded as distinctly abnormal. Nor do I refer to cases having a definite paranoid psychosis with outbursts of ex-

citement from time to time based on their hallucinations and delusions.

Instead, this paper is concerned with those cases in which from the outset of the psychosis delusion formation with egocentripital trend is a prominent, indeed often dominant symptom; but associated with fairly characteristic signs of hypomania; running a typical course of manic depressive psychosis with recovery and good insight, and in two of the cases here reported, showing other attacks of depression without in the latter phase paranoid ideas. Aside from their psychopathological interest, such cases strikingly demonstrate the importance of a careful study of the patient's entire life if we are to understand his psychosis.

CASE I. An Irishman, aged fifty-three, was admitted to this hospital on February 4, 1917. He had gone to a general hospital complaining of sensations in the legs as of a small snake creeping in the muscles. He believed that the men where he worked had leagued against him to injure him because he would not drink with them.

History.—One maternal aunt and a brother of the patient were insane. The brother had "religious insanity" and died in an insane asylum. The patient was always jovial, good natured, generous, and moderately religious. He was not a great drinker, although he reacted abnormally to liquors. He was a section foreman on railroad work. Married, with four normal children. In 1916, about a year before admission, the patient began to show some delusions of a religious nature. He heard the voice of the Triune; heard his mother call him; felt dizzy and creepy, prayed and cried. At first he was cared for at home by his daughter, but would not take the medicine prescribed by the doctor; became excited and screeched. It was necessary to commit him and he remained about six weeks in one of the state hospitals, seeming perfectly normal when released. He had returned to his work and had got on well until about a week before coming here, when the creeping sensations began. At this time he was also troubled with insomnia.

Examination.—Physical Status: Well developed, well nourished, moderate arteriosclerosis. Blood pressure systolic, 165; diastolic, 110. Pupils and reflexes normal. Cutaneous sensibility normal except for slight paresthesia.

Mental Examination.—Patient was clearly oriented, with good memory, extremely circumstantial in his talk without any flight of ideas. Very religious at the time. The history was told in very dramatic fashion with minute details and exact dates. At the time of this examination he did not have hallucinations, although he gave a history of previous hallucinations. He was very bitter against his daughter,

believing that she had tried to harm him when he was ill before, and laid his illness to the persecutions of a gang of men who were out to get rid of him. He had no insight. During the first two days, his conduct was good. On the third day he assumed an attitude of prayer which he maintained for over half an hour, resisting all efforts to move him, and refusing to answer questions. On the sixth night the patient became hallucinated, believed that one of the patients was talking about him and attacked the patient. During the next several days he had frequent, sudden, apparently impulsive outbreaks when he would dash blindly in which ever direction he happened to be facing, bowling over any one who was in the way. During all of this time he was quite egoistic, rather exalted, but of fairly normal range of activity.

Subsequent History.—He was committed to a state hospital, remained there for six weeks, and was then released on visit. On March 19, 1919, he was returned to us by the police, who found him acting peculiarly in a railway station. The day before admission he heard that his son's regiment was coming home. He composed a poem and an address of welcome, and came to town to arrange the details of the reception. He thought the people on the street acted in a peculiar manner as he walked along. He said they stood back from him and left a space for him to pass through. He thinks this was all very mysterious, and he found that he was followed by a group of people. He did not know who they were; did not believe they were going to harm him. When coming in on the train he noticed that any workmen who saw him, immediately dropped their tools, and acted as if they were going to take the next train to town. At this time he showed no more phenomena of manic depressive psychosis than a mild elation and overactivity. He was again committed and after about six weeks' residence returned home, where he now is.

It will be noticed that the general paranoid attitude in this patient was rather mild. Nevertheless, there are some delusions of persecution on the part of a gang and on the part of his daughter which are very well expressed while he suffers from the attack, together with definite ideas of reference and hallucinations. In the intervals his personality seems to be entirely normal, and he seems to be without such ideas, and he has indeed good insight.

CASE II. A woman aged fifty-two was admitted to the hospital on October 26, 1917, having been arrested on a warrant as an alleged insane person. The warrant stated that at least three times the patient had attempted to harm another young woman; that the patient procured discharge of this young woman, and she had one man arrested for trespass and another for assault and battery; that she had written letters derogatory to the character of this woman.

The patient stated that some weeks previously a man and woman had rented rooms from her. She discovered immoral relations between them and ordered them out. She stated that she had been a detective for twenty years and had handled many cases of note. She was very dignified, haughty, and overcourteous, supercilious, and condescending. She regarded the examiner as impertinent and stupid. She was egoistic and superlative in her talk. Her memory was unimpaired. She said she was a college graduate. She said she was employed as a detective by the United States Steel Company and later by Harry Thaw, helping to connive at his escape. She made many contradictory statements, asserting that she had great abilities which she could not demonstrate, and when these statements were brought to her attention was very elusive in her explanations. She regarded herself as a victim of a persecutory plot which had been in operation against her very much all of her life. There were marked delusions of grandeur and a persecutory trend. All of her friends were very intimate friends. She knew all of the influential people in America. The people whom she did not like were all devils.

History.—The patient was born in Maine, of American parents. It was difficult to find any one who knew of her family history or early life. One brother died in a state hospital; cause of psychosis unknown. The patient was married at the age of nineteen; had one child now living, and one miscarriage. At thirty-two she suffered a "profound prostration" for six weeks and was later in a state hospital for eleven months. At thirty-three her husband divorced her. Following that she made some business ventures which failed due, she stated, to the faults of her partners. In this period the evidence indicates that she was sexually promiscuous. In 1905 she married again and in 1909 was sent to a state hospital. She declared that she was railroaded there on the charge of using drugs. In 1911 her husband divorced her on grounds of adultery. She stated that this was really not true and that he still loved her, but, as she no longer loved him and desired to marry another man, this ground was chosen so she would not have to wait three years for the divorce. In 1912 she married a man thirteen years her junior, to whom she is still married, although they have not lived together for a number of years.

Abstract report from the state hospital to which she went in 1897 states that there had been a depression and attempted suicide, and at the time of admission there was elation, excitement, ideas of persecution, and a grandiose trend. She asserted that she had been abused, indecently treated by her husband, and finally railroaded by him. She was very troublesome and deceitful while in the hospital. After eleven months was discharged, improved. In July, 1908, she began to have delusions that certain people were defaming her character and wanted to sue them. She had her sister arrested on a charge of adultery, and

when the case was thrown out of court wanted to impeach the judges. She was committed October 13, 1908, at which time she was suspicious, had delusions of persecution, blamed other persons for all of her troubles, was self-confident, egoistic, and attempted to impress other people with her great importance and great virtue. In the hospital she was continually in trouble, presented a delusional falsification of her past, pretending to be a college graduate, and a person of considerable note with many influential friends. Although proved immoral, she denied it and accused others of her own misdeeds. A diagnosis of "litigious insanity" was made, as she was involved in many law suits at that time. Six months later she was discharged with a diagnosis of manic depressive psychosis. Three months after her discharge a depression of short duration developed.

She seems then to have been normal until the summer of 1917, when overactivity on a large scale began. She was at that time running a lodging house and, with practically no capital, rented three additional houses which she intended to furnish and let to individual roomers. However, the margin between her promises as to furniture, etc., and her actual performance was so great that her roomers would not stay. She was very effusive to every one when she first met them, but as soon as she was crossed or contradicted in any way, or her attention drawn to her delinquencies in fulfilling her promises, she at once turned against them, and included every one with her persecutors. She accused all the young women of immorality, became involved in a number of law suits, some brought by herself and some brought by others, became convinced that people were defaming her character, trespassing, stealing from her and trying to injure her in other ways, though the truth was that she was the offender in most instances. Her affairs finally became so involved that she was sent here for observation.

Examination.—Physical Status: Teeth artificial. Heart, lungs, and abdomen negative. Blood pressure, systolic 200; diastolic 108. Neurological: Normal.

Mental Examination.—The patient was alert, suspicious, haughty, domineering, supercilious, over-active and circumstantial. She was correctly oriented and able to give in minute detail her view of all the recent happenings in which she was involved, but her memory was distinctly defective for the events in her early life. She accused many people of wrongdoing and of mistreating her, regarded herself as persecuted, and in this hospital as a result of a plot. Every one was either her dearest friend or her most bitter enemy. She was quite grandiose, retailing her marvelous connections to any and all who passed. She wrote numerous letters, etc., very loving or quite scurrilous. Her conduct was good except that her talkativeness, and letter writing in the attempt to put her case before every one, made considerable trouble. She told her story freely to any one at all who would listen.

Further Course.—She was committed as insane. At the end of three months had become depressed and attempted suicide. Six months later she recovered and was out on visit doing well.

The patient seems always to have been a rather difficult person, alert, energetic and intelligent, though poorly controlled in her social relations. When first seen here, her hostile attitude, multitude of charges against others, grandiosity, and ideas of reference all indicated the presence of a paranoic condition. However, the definite history of attacks from which she recovered, both of depression and of elation, and in the elated phases the definite persecutory trend of all her ideas together with her good insight in the intervals between attacks, all tend to confirm the diagnosis of manic depressive psychosis.

CASE III. An intelligent man, aged forty-five, of good social position, was brought to the hospital August 24, 1917, by agents of the Department of Justice with the statement that "he has had delusions regarding the affairs of state and nation for a number of years. Lately he has been sending telegrams to the President and other high officials denouncing men and corporations for carrying on questionable business enterprises."

When first seen the patient gave a definite impression of a paranoic psychosis. He expressed many ideas that seemed to be delusional with reference to the relations of the large financial interests to the government of the country. He did not regard himself as a prophet or as one having a great mission, but believed that he was aware of conditions which the American people in general should know about. In his attempt to awaken the people he issued a series of publications at his own expense, utilizing the various cartoons which had appeared in the papers, together with virulent attacks on those in charge of the Government at the time. The first publication in the series was issued in September, 1916. It involved a comparison of various persons in the government with the parts assigned in Shakespeare's *Hamlet*, which was very interesting indeed. There were then issued a series running over into 1917, together with a large number of letters and telegrams attacking the President, Secretary of the Treasury, and various congressmen. A delusional trend is evident in all of these. They came in two distinct series. The first was at the time of the presidential election in the Fall of 1916; the second at about the time that the United States entered the war in 1917. He objected strenuously to the appointment of certain men with German names to high boards. He armed himself with a revolver and a knife in order that he could protect his family from the anticipated German invasion, and it was feared that he would use the revolver in other ways.

On examination he was alert, active, giving a very detailed account of all of his difficulties. He believed that the Germans had an agree-

ment with certain large bankers in this country; that the rest of the country was afraid of New England; that the German interests controlled the Secret Service; that large pro-German activities in this country were in some way directed against him, and he had set himself up as the apostle of light in this country.

Physical Examination.—Entirely negative.

History.—The patient's father committed suicide at sixty-four by drowning. At the age of thirty-eight he had been adjudged guilty of misappropriating funds, and sent to prison for two years. He was then at home; was very much excited. At the age of forty-three was committed to a state hospital where he remained until his suicidal death. He had ideas of persecution, and fancied that it was his mission to set the world right. He had some unusual religious ideas; was arbitrary, arrogant, and after some years in the hospital took a violent dislike to the institution and the people who cared for him. He continued to express some delusions and to attempt to control the hospital environment during his life. An older brother of the patient had an attack of depression at twenty-seven, and at forty-four he became excited and started some litigation, and then became depressed and had a feeling of inadequacy; recovered in three months and has since been entirely well. The patient is a graduate of the Institute of Technology, always sociable, democratic, optimistic, honest, intense, a persistent worker, altruistic, fond of out door sports. He had been very successful in his past work, employed first in the telephone company, later by an electrical manufacturing house, and still later as a bond salesman. At the present time he is a private banker. In all of these positions he has been very successful. In 1909 he had a definite period of excitement when involved in the analysis of the affairs of the company in which he had invested some money, and in which he was convinced that the financial interests were perpetrating a steal. He overworked for a considerable period, following which he had a short depression. His first mental difficulty occurred in 1902 when he was mildly depressed for a short period but soon recovered. He showed intense excitement in preparation for the litigation previously mentioned in 1914. His next attack was in 1916 at the time of the presidential election from which he apparently recovered, since he showed no further excitement when the election was settled. Being intensely patriotic he attended two Plattsburg Camps, but was not accepted for the Army because he was over age. In the latter part of the summer of 1917 he began to dress peculiarly, carried a loaded revolver as before stated, so as to protect his home from anticipated attacks by the Germans. He sent many telegrams and letters and went to the Attorney General's office carrying a revolver and a knife, trying to interest the Attorney General in preparing for German aggression. At this time he was quite excited, and became somewhat more so, although at no time did he give evidence of hallucinations, memory disturbance, or deterioration.

Further Course.—The first diagnosis made was paranoid condition, soon changed to manic depressive, hypomanic. He was induced to go voluntarily to an institution for the insane, thus avoiding commitment; spent six weeks there, and made a good recovery, and since that time has been engaged in business in Boston without any diminution of energy or intelligence.

The diagnosis in this case was somewhat difficult, as he was known to entertain ideas for a number of years which at least bordered on the line of delusions. However, these had a considerable basis in fact, and were not, in our opinion, unwarranted delusions from things which the patient knew. They apparently caused him no trouble and gave rise to no social difficulties except in his psychotic episodes when he bombarded his enemies with what he called torpedoes, and when he became, indeed, very troublesome. The father's history would lead one to expect a delusional trend in the patient and possibly a delusional psychosis, but the definite history of previous depression and excitement, followed by recovery, in the patient, and the definite history of depression and excitement with recovery in the brother, the excitement taking the form of litigation, is enough to substantiate the diagnosis of manic depressive psychosis.

Two of the three cases here reported fall into the group of querulants or litigants, but only so in definite episodes. The recent books on psychiatry hardly mention such a group, except incidentally. Kraepelin and Tanzi both speak of the periodic occurrence of such states, the former associating them with constitutional mania. The rarity of such cases indicates the necessity of very careful psychopathological study of all such cases when they are encountered.

The other case is not of this type, but of a type which is not so frequent now that we no longer speak of religious mania but instead classify the cases according to the modern groupings. In the psychotic episodes there are religious delusions and hallucinations associated with the ideas of persecution. Probably such cases are more frequent than we realize because, on account of our present methods of classification, there is no way of keeping them separated.

HOMO-SEXUALITY AND ITS TREATMENT

BY J. ALLEN GILBERT, Ph.D., M.D.

PORTLAND, OREGON

The patient who served as the subject of the following history applied to me for psycho-analytic examination and treatment for a phobia which had been troubling her ever since childhood. For manifest reasons, her name is withheld, but will be designated as "H." Age, 26. Unusually high grade of intelligence, alert, ambitious and, all in all, decidedly of the higher grade of humanity, when judged by the customary standards.

The psychoanalysis, with reference to her phobia, was unusually successful in disclosing the underlying cause. H had no idea of revealing her homo-sexuality when she came for treatment for the phobia. Psychoanalysis revealed only too plainly that her phobia was really an old association which indelibly associated her phobia with a step-father, who was distasteful to an extreme.

The psychoanalysis revealed other side lights which were a thorough surprise to both H and myself. She proved to be a splendid subject for both the hypnoid and word-association method. A very few tests with each made it perfectly plain that there was some sexual affair at the bottom of her difficulties. I decided to put my suspicions at her rather bluntly and observe the effect. Consequently, I said, "Even our short investigation up to this point seems to indicate that the whole trouble is connected in some way with sex."

As chance would have it, she was not eyeing me at the time that I said it, though she usually looks one squarely in the eye during conversation. At the mention of the last word, "sex," like a flash her eyes met mine; there was a momentary hesitation with a quick reassertion of self-control; and, very adroitly the conversation was changed and carried along until she could leave without abruptness, and she closed the consultation.

Judging from her manner of leaving, I feared that I had offended her and suspected that there would be no further interviews on the subject. However, after the expiration of about two weeks, she came to the office again. She entered the consultation room

with manifest uneasiness, and, as she started to talk, her eyes wandered here and there as if in search of something on which to rest. Hesitation and embarrassment were manifest. Finally, she met the issue squarely. She explained that since she last saw me she had had quite a struggle to bring herself to disclose a fact which was not known, except to a very few intimate friends, as will be seen from the following history. She made up her mind that this was her chance to meet the difficulty and correct it, if possible; at least, to do the best for the condition that could be done. She then recited in somewhat disconnected and fragmentary form the following facts, which she later wrote out as an auto-biography in chronological order at my request.

HISTORY

Seven Periods.

1. 2-10 years (Grandfather's Farm).
2. 10-12 years (Fruit Farm).
3. 12-18 years (Albany, Oregon—Seventh and Eighth Grades and High School).
4. 18-20 years (Albany, Oregon—Albany College).
5. 20-22 years (Stanford University).
6. 22-23 years (at large).
7. 23-26 years (Medical School).
8. Transformation—1917.

Family History.—Grandparents apparently normal. Paternal grandfather was a man of pronounced ability and high standing in his community—farmer by occupation. Maternal grandfather was a man of remarkable vigor, physically and mentally; though deprived of educational facilities in youth, was always intensely interested in political and economical questions and widely read on these lines; a thorough Christian and greatly respected by all his associates; equable disposition, but determined and strong-willed; alive and in fair health at age of 75. Maternal grandmother was a woman of marked neurotic tendencies who was never vigorous; married at eighteen years, had four children; a “crank” on temperance, otherwise little interest in public questions; at age of fifty, following death of two sons, took to bed with “nervous prostration” (hysteria) of which she was “healed” after six years by “divine healers”; since that time has had varying health, but has been persistently neurotic; alive and in indifferent health at 73. Her four children: 1 died in infancy of whooping cough; 2 sons

lived to be 18 and 20 respectively, and died at once of typhoid fever; oldest child was patient's mother.

Father.—Born in 1861. Always strong and healthy. Never in bed till time of death. Always a good student; went part way through college, and also had a business education. Engaged in a variety of work in various cities and localities until about 25, *e.g.*, farming, surveying, office work, etc. Then became a merchant (general merchandise, hay, grain and hogs) until death. Much interested in politics; fond of debates on these questions. Never quarrelsome, but quick to fight in defense of rights. Always came to be a leader in any undertaking. Popular with other men. Never specially "chased" women. Died in 1892. Very fond of wife and child and devoted to them.

Mother.—Born in 1865. Exceptionally strong and healthy. In fine physical condition at age of 52. Unusually energetic. Loved noisy, outdoor games as child and young girl. Popular with men, and "kept company" with many different ones. Always strictly "moral" in her relations with men. Married at the age of 23. One child at the age of 25, has never been pregnant since. Sexual history normal; menopause with little disturbance. Only pathological history is of rheumatism from focal infection during the decade from 40–50. Always has had a high temper, inclined to be dictatorial, tried to manage patient after she was old enough to resent it, tendency to say rash things when angry, inclination toward the neurotic and emotional type. Had good business training and was exceptionally good business woman. Very fine student, especially in mathematics. Very fond of family, but undemonstrative. Married for second time at the age of 30. Second husband dominated by her always. Both alive and well in 1917.

Personal History.—H was born Oct. 4, 1892. Healthy infant of 10 pounds. Good health during infancy except for an attack (probably broncho-pneumonia) at 15 months, which resulted in complete recovery. After death of father in August, 1892, removed with mother to the farm home of maternal grandparents.

Very active child as soon as she was able to walk. Played with and teased small dog a great deal as a baby—would love the dog at one time, and later run after him with a stove poker to torment him. Not afraid of strangers after age of 1½ years. Always would go to men before women. When away from home insisted on being with father rather than mother. First public appearance at 4 years, no fear at all. From first showed much initiative. When in house imitated whatever mother did, outside always played

"horse and wagon." When mother would talk to her about father being dead and how they were left alone, she would always say that she would grow to be a man and take care of mother. Also insisted on sitting on the right side of the buggy when driving with mother, giving as a reason that she was the "man" of the family. Up to the age of four seemed to like dolls; these dolls were all girl dolls except one rag doll; always played hospital with them for patients or at taking them somewhere. Never played very much with dolls after this except in hospital game. Learned alphabet by herself from building blocks before age of 3. Between three and four, got so she could read Sunday School papers. Slept with mother till her second marriage. Even when very young, she always wanted pockets on her clothes. About 5 or 6 years began to like women and "make up with" them sooner than men. Mother says she never noticed anything unusual about child except her activity and inclination to boys' games, up to age of 6 or 7. H's first clear memory is of standing at window looking across road while grandmother curled her hair. She always remembers a large volume of bible stories with lurid illustrations of which she was fond. Vague correlated memories of the trip to P—at age of 4—trip on train, large stores, street cars, new blue suit with gold braid, etc. Hazy memories of large dog, Bruce, of whom H was very fond, also of trips to barn and animals seen there. Very much interested in horses. Some time before age of 5, had some fire-crackers which child enjoyed very much.

Mother married second time when child was $4\frac{1}{2}$ years old. H disliked this man, and has unorganized memories of his courting her mother and of her own resentment at losing her mother's company. Remembers preparations for wedding, the ceremony, and the supper afterwards. Went to live in a small town with mother and stepfather. Lived beside a small canal and played with a boy of the same age who lived across canal. In a fit of anger one day, H threw a kitten down stairs and killed it. Disliked stepfather, would play rough noisy games with him, but absolutely refused to allow him to dress or undress her. Vague memories of going with parents to various social functions. Vivid memory of Xmas celebration with tree at church, a Santa Claus, and presents. Also saw her first corpse at a funeral, but got no impression of horror.

When H was 5 years old, her maternal grandmother suffered a nervous breakdown, and Mr. and Mrs. B. with the child moved back to farm to care for her. They lived there until H was 10 years old. During early part of this period H showed some jeal-

ousy as before for stepfather; as child grew older, other interests crowded it more into the background. Severely ill for 3 or 4 months at age of 7 with whooping cough—recovery good and general health better afterward. Child taken regularly to church and Sunday school and became rather ultra-religious. Slept in same room with mother and stepfather, and used to wonder what they were doing when the love demonstrations became too audible. Grandmother's inordinate fear of chimney fires caused a dread of them in H's mind also—she used to pray to avoid them. H was not allowed to attend the country school but studied irregularly at home. Very dull in arithmetic and spelling, but loved to read. Spanish-American war stimulated child's interest in history and geography. Intensely interested in Civil War; for several years by aid of wooden guns, it was the favorite game. Grandfather read single tax, politics and current events to child who was much interested in Presidential campaign of 1896, and in its issues. Child had no fairy stories or literature of that type. H read a great deal, *e.g.*, Sunday-school magazines, novels, biographies, travels, adventure stories. She dramatized the books read and acted them out as far as possible. Volume of H. M. Stanley's African travels was a favorite; the pictures of naked savages and the stories of hunts and battles were enjoyed especially. Began to wonder about sexual matters. Read the "family Doctor Book" and looked up many words in dictionary. Read "Pilgrim's Progress" about this time; this resulted in the child's becoming afraid of the dark for the first time; she concealed this fear so well that the family never suspected it.

Was a very active child. Did a boy's work about the farm. milked the cows, learned to ride and drive horses. Very fond of grandfather, whom she followed everywhere. Liked to listen to the men who came to the place, discussing politics, agriculture, etc. Always played at barn or in tool house unless confined to the house by stormy weather, when "store" or "hospital" was the favorite game. Never played house or at being the mother of dolls. At the age of 7 H refused to play with dolls with small girl visitor unless as head and father of the family. Spent all money earned for pocket-knives which she lost rapidly. Often recited in public and won several prizes; enjoyed these appearances greatly. H was an obstinate independent child who resented anything that smacked of "bossing." Undemonstrative and shy about showing feelings—although very affectionate underneath. Family had a large number of cats. H was fond of these animals but had a streak of cruelty

which made her often beat them. Forced by isolation to play almost wholly alone. Developed self-reliance, *e.g.*, having chopped a finger off with a double bitted ax, H dressed wound herself and said nothing about it to the family.

Always regarded herself as a boy, and thought she would be a boy if only the family would cut her hair and let her wear trousers, which she earnestly besought them to do. Always liked to wear boys' clothes and felt most natural in them—often wore overalls in summer. Had a marked aversion to undressing downstairs before the family; those present being mainly women. Enjoyed hearing maids talk of their admirers and social pleasures. Remembers distinctly the pleasure derived from reading love scenes in novels, which, later, she would always dramatize with self in rôle of hero opposite the girl then admired. Much given to day dreaming, which always concerned love affairs with herself in the masculine part and the achievement by herself of fame and fortune. Indifferent to her own clothes but enjoyed looking at shirts and collars, etc. Made collars and cuffs out of pasteboard which she wore in the effort to look as much like a man as possible. Being married as a man was a favorite imagination—visualized herself as kissing and making love to these women of her dreams. Exact nature of the sex act was not yet clear in her mind, all information thus far having been derived from reading, stolen glimpses of forms of men and women, and observation of animals about the farm. Was desperately "in love" with each of a series of maids employed about the house; wrote long effusions to them which she usually tore up, but which she now and then gave to the object of her affections. H would have been glad to kiss these girls and come in physical contact with them, but was always afraid to do so.

Dislike for stepfather persisted. His teasing child with a pop-gun and the association of him with her first hearing the report of a shot-gun produced a phobia for that sort of a noise which still persists at the age of 26. (This phobia was her reason for first consulting me. Psychanalysis revealed its underlying cause with unusual promptness and success.) However, H was still fond of adventurous stories and listened eagerly to those told by men returned from eastern Oregon and the Klondike, wishing that she too might do those things.

Possessed a very disagreeable temper and when in a rage would throw herself upon the floor, hold her breath, froth at the mouth, kick, etc. This temper persisted with little attempt at control until H was in her 'teens.

From 10-12, H lived on a fruit farm with mother and stepfather. No illness of note. Still noisy and active. Picked prunes, milked, cared for horses, rode bicycle, played in very high and dangerous swing, etc. Hated all sorts of housework and would never do any unless compelled. Fond of farm animals, never afraid of them. Only went into town on rare occasions; preferred the farm. Still religiously inclined. Often seriously thoughtful when alone, and never lonely although alone a good deal. Careless about appearance; comfort and convenience came first. Dislike for stepfather still marked; very fond of mother, although undemonstrative.

Still read a great deal—travel, adventure and love stories. Especially fond of "Tom Brown's Schooldays" and "Tom Brown at Oxford." Still dramatized all she read; especially the love scenes. Not studious in school. Always fond of teachers. Inclined to idealize women teachers and visualize love scenes with them. Liked to talk to them and wait on them but never told them of her erotic feelings or made any attempt at physical contact. Crude drawing of intercourse circulated at school amused H greatly, though it horrified the girls. No interest in boys like other girls had. Was leader and champion of girls *vs.* boys when disagreements arose; almost choked to death one especially obnoxious lad in such a fight. Liked to play "Black Man" and "Crack the Whip," etc. Was noted for being rough in play. Was not afraid of the dark now and used to be sent home as escort with a maid who lived at some little distance from H's home. Greatly admired two rather fast young college men who visited at the home, and tried to ape them in manner and actions; attempted to make a cigarette of leaves and paper and smoke them. Liked older people better than children, men more than women. Still followed men about over the farm and helped with work of the farm.

Had a girl chum of same age who lived across the road, with whom she played almost all the time—but toward whom she never had any sexual inclination. By age of 12 had a fairly complete knowledge of sexual reproduction. Conducted personal anatomical research by aid of chum, and studied "comparative anatomy" on available animals. Cut peep hopes in the back wall of the boys' toilet at school to further the discoveries. Still slept in the same room as mother and stepfather—began to understand what went on. Periods of erotic excitement began and soon became frequent and noteworthy. Erotic day dreams about other girls of her own acquaintance with whom she fancied herself in love—herself always

in the rôle of the male. Also had these dreams concerning purely imaginary women. Never spoke of these day dreams to anyone. Never made any attempt at physical contact with any of these girls, although the mental picture of it caused intense excitement. H's romancings always stopped short at marriage and did not go on to a home and children. By age of 12 was familiar with physical appearance of both sexes. When H heard mother and stepfather having intercourse at night, she vaguely resented such treatment of her mother and yet experienced an intangible, pleasant excitement at the thought of the relation so near at hand.

Two women dominated this period. (1) Nell P., who was about 16 at the time, fair, blue-eyed, very attractive, with beautiful auburn hair. The attraction for her persisted for several years even through infatuations for others. H visualized many love scenes with her, always ending in marriage. When Nell P. once spent some weeks in H's home, she delighted to wait on her and be near her. H would have liked to touch her and kiss her but was afraid. (2) H admired Olga P., her teacher, a little later during this period. She was about 21 or 22, tall, and dark. H often dreamed of being a boy-pupil of Miss P and about 18 or 20 years old, so that in any time of physical indisposition of Miss P., H could relieve her or take her to the Doctor or, finding her with a sprained ankle, carry her home a la "Tom Brown at Oxford." Dreamed over many love scenes with this girl.

Family moved to town so that H could have better school advantages. Entered seventh grade. H was "green as a gourd," thin, poorly dressed, and unattractive. Seat-mate was tall, dark, good-looking and very scornful of H. D. B., who was small, slight and dark, was kind to H on this first day of school and so won her heart. Town children annoyed H by making fun of her clothes and calling her the living skeleton. Consequently, H shrank into her shell and began to have some interest in her work and study at home. She rapidly became the best pupil in her class. An elderly woman, Mrs. C., who lived in the same block was kind to H, would talk to her and hear her troubles. H used to read a great deal in Mrs. C's Encyclopoedia Britannica. This association lasted with H till she was 18 years old. A "gang" of girls played on a vacant hill near H's home and H wished greatly to join them but was not permitted to do so. Took a long walk with her mother on Sunday afternoons. The religious routine for the years from 12-18 included two church services. Sunday school and Christian Endeavor Society every Sunday, with family worship once or twice daily be-

sides. H gradually came to know the girls of the neighborhood a little and play with them somewhat. Joined in outdoor games whenever possible, often sneaking away from home to do so. Some spasmodic interest in collecting butter-flies, bugs, beetles. Purchased a piccolo with her own earnings with which she made day and night hideous. Schoolmates ridiculed sun-bonnet that H was forced by her mother to wear until H wore fascinator or felt hat all summer rather than the despised bonnet. Mother tried to coddle her and dressed her too warmly—consequently she took cold easily. Always active and lively. Menstruation began at 12½ years—irregular at first, but not painful. Thyroid enlargement came on about twelve years and persisted till 16 when it disappeared—never any symptoms except swelling. Upon entering the eighth grade, H met a teacher who had a profound influence over her till after she graduated from high school. Miss B. was small and dark with piercing black eyes. H admired her for her ability and respected her greatly but had no sexual inclination for her at all. Passed into high school with the highest grades in her class.

By this time H was deeply infatuated with D. B., who had affected her sexually from the first. However, H did not suspect the nature of the affection. She liked to be with D. B. as much as possible and was always quick in her defense either physically or verbally. H would spend hours alone with D. B. whenever it was possible, ensuing in such a state of nervous excitement that violent exercise came as a relief. Always wanted to love her and kiss her, but never dared to do so. Never embraced D. B. or spent a night with her in all the years they were together. At this time H began also to build air castles of life with D. B. as husband and wife. In these dreams H was a doctor and they had a beautiful home. H loved to visualize a whole evening in this home—*e.g.*, return from the office, dinner with D. B., long evening spent at home love-making or out driving, followed by retiring together and intercourse. These dreams always left H in great excitement. She enjoyed visualizing the sexual act with herself always in the active rôle, and every possible variation of place and posture. Without instruction from any one, she began to masturbate at the climax of these dreams. H even derived savage pleasure from the thought of indignities offered D. B. by herself, *e.g.*, inspection of H of her perineum, forcing her to urinate, etc., in her presence. But she was always overcome by love and pity afterward and in her dream would apologize to D. B. For some unknown reason, H's mother objected to her association with D. B. and so much of their

companionship had to be clandestine in real life. This objection was transformed in H's dream life into an active persecution of D. B. as H's wife—against which H valiantly defended her. She thought D. B. the most attractive girl in the world and was plunged into despair when a small quarrel deprived her of D. B.'s company. In vacations H spent as many afternoons and evenings with D. B. as possible, reading to her, talking, or kodaking. Wrote stories and novelettes to read to D. B. in the hope of hearing her praises.

In high school H soon came into prominence. Took great interest in all student activities and had a great deal of responsibility in them. Was student body officer, executive committeeman, manager of H. S. paper, on debating team, etc. Wrote for school paper and in various essay contests with considerable success. The teacher, Miss B. was H's guide and adviser in these undertakings. H admired certain boys very much but never thought of them in a love relation. She played ball on evenings and Saturdays with the boys of the neighborhood until 18 years of age. Began to take interest in physical culture and to take cold baths and systematic exercise. This resulted in rapid physical improvement and increased strength.

H formed definite habit at this stage of dreaming aloud to herself after retiring concerning the romances that occupied her mind; these dreams were accompanied by definite erotic excitement. At 15, she became infatuated with a married woman living across the street who was about 25 years old, tall, fair, and attractive (Mrs. S.). She had just lost her six-year-old daughter and liked to talk to H of the child, religion, etc. For more than a year H spent as much time with her as possible, and wrote a "novel" with Mrs. S. as heroine opposite herself as hero. Never touched Mrs. S. or kissed her or had any physical intimacy whatever. A certain peculiar perfume used by Mrs. S. always appealed to H. H visualized a portion of the novel she wrote in her day dreams in bed every night; marked voluptuous excitement accompanied these dreams, also masturbation at times. After about a year, Mrs. S. moved away and H did not see her again for 10 years, although she always remembered her with fondness.

All this time, D. B., although somewhat in abeyance, retained her hold on H's affections and now reigned again supreme. Always kept up her school work and retained her prominence in school life. Cared but little for social pleasures and never went to parties where boys were present because she did not "get on" socially with them, did not like them, could not talk "small talk" like other girls, and

knew the boys did not like her. Was but little interested in clothes and permitted her mother to select them, wearing whatever was provided. Showed absolutely no interest in household matters and absolutely refused to cook and sew. Intensely interested in athletics, especially football, in which she became an expert as to rules and records. Was an omnivorous reader of history, politics, current events, and novels. Enjoyed public speaking and debating greatly. When D. B. was forced to stay out of school by illness, H painfully made a written translation of a large part of Cæsar for her.

At 17 years, for some months H dreamed of courting and marrying a young teacher in the high school, Mrs. P. The most intimate details of love-life and home-life were visualized with intense erotic excitement. At times during all these episodes H would return to the old dreams of D. B. There was always the warmest affection between them which resulted in much time spent together and many gifts from H. At 17 H spent an afternoon alone with Nell P., now married, who was then pregnant for the first time. She found that the girl had all the old attraction for her but rather resented the fact of her pregnancy and the pain it would entail her.

An injury at age of 14 had resulted in dysmenorrhoea which was treated and relieved about this time. Amount of flow began to decrease slightly and gradually. Health good, abundant energy, never tired, masturbation never carried to excess. Began to show more interest in clothes but had marked preference for tailored things and clothes and ties.

D. B. still foremost in dream life. H spent much time with her and had for her a very real devotion. Was extremely jealous of boys and men who showed D. B. attentions. H went to a few parties during her last year in high school but was not very popular except as a clown for purposes of entertainment. Took great pleasure in showering gifts upon D. B., who was very poor. H was generous and extravagant in money matters. D. B. once told H that she would have married her had she been a man. Still H never embraced D. B. or spent a night with her or masturbated in her presence.

About this time, H met a distant cousin, Henry, who was attentive to her for some months. Enjoyed being with him and even did a certain amount of "spooning" though she did not enjoy the latter.

Twice during this period H met attractive girls with whom she was thrown for a few weeks and to whom she was definitely at-

tracted. Separation occurred in both cases, however, and after a few months H thought but little of them.

During this period, H began to have some control over her temper so that paroxysms of earlier years gradually ceased. Family would not give her an allowance so she had only what money she could pick up herself. Began working in spare time and vacations for a photographer; developed a violent interest in this work and became quite successful as a scenic photographer, in which line she continued till the age of 22. When scarce of cash, would steal what was necessary from mother's or grandfather's pocketbooks; never liked this and was glad to quit it so soon as possible. Also took music lessons on the mandolin for four years and became moderately good performer. Was graduated from H. S. in June, 1908, with second rank in class.

H entered local college in 1908. Knew no one there and so studied and worked hard all the first year, going out but little until spring. Took usual college course. Discovered a decided liking for physics, economics, philosophy and allied subjects. Took second place in local oratorical contest. Came into father's estate in spring and went wild over the joy of spending money. Became popular because of the money-spending. H was aware all year of an attraction to a classmate, E. C., but had not had an opportunity to know her well. Acquaintance followed an accident in the spring. E. C. was short, dark, brown-eyed, attractive though not very pretty, and very popular with both boys and girls. During the last five weeks of this year, H was with her almost constantly, although nothing more than ordinary love-making and kisses passed between them. At the same time H was going about somewhat with E. C.'s brother, though she cared nothing for him. H worked all summer at photography except for a few weeks spent at E. C.'s home in the mountains. While they were apart, H wrote E. C. violent, daily love-letters. During H's second years in college the intimacy ripened and she spent much money on gifts for E. C., mainly candy, flowers and jewelry. Also took her driving or automobiling several times weekly. They attended a great many public functions together. H never went to dances or to parties where she would have to be much with men. H spent at least one night a week with E. C. Their relationship progressed to more intimacy—there was much kissing and love-making, and also some actual sexual experiences, during which H had E. C. manipulate her. Mutual masturbation was resorted to at times. There was no thought of shame on either side. E. C. seemed devoid of passion but very anxious

to give H pleasure. H possessed more sexual knowledge than the average woman, but knew nothing of psychopathy and did not realize that her own condition was abnormal; it always seemed perfectly right to her. H always played the rôle of lover toward E. C. During the first night they spent together (at the close of H's freshman year) neither slept at all; H made violent love to E. C. with constant kisses and caresses but no actual sexual advances; E. C. seemed half-stunned and did not respond very warmly but neither did she resist. After the eight weeks' separation during vacation H was wildly excited at seeing E. C. and could hardly wait for the privacy of a bedroom before embracing her; she spent the night thus, which only served to increase her passion. However, H did not masturbate in E. C.'s presence. During the second year, when they practiced mutual manipulation, H derived great pleasure from this contact with E. C., though the latter seemed to care very little for the manipulation of her own person. H also liked to caress and fondle E. C.'s body but this never seemed to gratify her greatly. It gradually came about that E. C. did most of the active manipulating till a certain stage of excitement was reached by H and involuntary spasmodic movements began on her part. H really loved E. C. very tenderly and very passionately. Saw her first light opera with E. C., which produced pronounced though inhibited sexual excitement.

H was a better student than E. C. and delighted to aid her in her work. She also furnished her money to live on and cared for her in every possible way. H was active in all student activities; leader of Women's Debating team, first associate on college team, college representative in State Oratorical contest, manager of College Annual, etc. Active in Y. W. C. A. also, although she had a private conviction that the Christian religion was a fraud. Was a leader in many strenuous college pranks. Active in sports, *e.g.*, tramping, tennis, hunting. In vacations did commercial photography in the mountains, camping and traveling with a pack-horse. Became more fastidious personally and in her dress, but still delighted in strictly tailored clothes. Now began to wear shirts, collars and ties—also to wear suits almost wholly, keeping the coat on when indoors. Also began to take week-end trips to a neighboring city where—always with E. C. in tow—she “took in” theaters, comic operas, vaudeville, cafes, etc.

During this time H had no other affairs. D. B. had become a stenographer and gradually they drifted apart, although still warm friends when they met. There was one young woman on the

faculty for whom H entertained a sort of idealizing passion which never came to light in any way. For her other friends, H had a genuine unsentimental affection. Her relations with the men of the college were frank, friendly and unsentimental. H's family opposed the social life of the school, so that much "sneaking out" and deception were necessary for H. Clashes with mother were frequent as she resented H's growing independence and tried to dictate to her as a child. H never made her mother a confidante, and during this period began to have an actual physical aversion to her and regard her as an enemy.

In 1910 H decided to enter — University. Since E. C.'s parents could not afford the expense, H took her with her at her own expense, since the separation would have been unbearable.

H entered premedical department at — University; also took up work in economics and philosophy. Was active in Social Service Club, Physiology Club and Philosophy Club. Leader of Women's Glee and Mandolin Clubs and founded first Women's Debating Club. Was officer in women's dormitory. Refused Greek letter election because E. C. was not bidden by the same sorority. Did a lot of outside reading in economics, philosophy and psychology. Did considerable investigation of social service work in S—. Worked hard and received very high grades in studies. H became intimate with a small group of girls who represented almost every type and line of work; liked them all very much but had no love affairs with any of them. Devoted to E. C.—rarely went anywhere without her. E. C. went now and then to dances with men; H was jealous but still wanted her to have a good time and so permitted it. H enjoyed caring for E. C., paid her bills, bought her clothes, and showered her with gifts and luxuries. Went to the city almost every week-end, usually taking E. C. along. Became very fond of the theater, operas and concerts. Met people in S—who frequented cafes, and with them began to go to late suppers, cabarets, and drink and smoke. Often went down in the tenderloin, dance-hall district. There H met a dancing girl who had not yet become a professional prostitute; this girl was big-hearted, young and attractive; she and H became quite intimate for a few months; H used to visit her in her apartment. There was a definite sexual attraction on H's part, also some experiences in tribadism. H also met a married woman about 8 years her senior who was small, dark, witty—a cripple from childhood; the warmest friendship sprang up between them, which still persists 7 years later; there never has been any trace of sexuality in it. First rift now

came between E. C. and H. E. C. insisted upon H having a completely feminine wardrobe for formal occasions, to which H submitted with rather poor grace. Still insisted on extremely tailored things for all other times. Also E. C. did not approve of H's smoking, drinking and going to fast cafes. However, H persisted in doing these things, attempting to placate E. C. afterwards by handsome gifts. E. C. did not approve of H's extreme democracy and disregard of convention, *e.g.*, scolded her severely when she carried lumber and materials for some shelves in their room out from the saw-mill and through the campus to the Hall. Consequently, the passion of this partnership subsided somewhat; until ordinary lovemaking and kissing constituted almost all of their relationship. The summer between these two years was uneventful for H, being spent partly in scenic photography and partly visiting the family. Last year in college much like the former one. Status remained almost unchanged between E. C. and H, except that H now met with financial reverses which worried her greatly. Seemed impossible for the "firm" to get along with less than \$300-350 per month. H concealed the true situation from E. C. and went on living as lavishly as ever to her. The personal relationship was now well regulated; there was always kissing and loving and once or twice weekly sexual relationship, during which E. C. would manipulate H and give her orgasm and definite relief. It is doubtful whether E. C. ever had an orgasm.

When graduated, H was deeply in debt and greatly embarrassed financially. Abandoned plans for medical education temporarily. Spent the summer at commercial photography.

At the end of this period H was a strong, well-built young person of great vitality. She had done considerable rowing, motor-ing, and swimming, and had become an adept in camping in the open. Very fond of music and the theater. Showed rather a talent for comic "stunts" such as are used in glee clubs. Addicted to late hours, theaters, midnight suppers and revelry; drank and smoked freely also. Relations with men were still of friendly, frank, unsentimental type; liked to work with men but socially cared only for women.

Intercourse with man undertaken by H at 21 years out of pure curiosity. Man was normal and potent. H states that there was some slight physical pleasure but that the mental disgust was so great as to render the whole affair so obnoxious that she left unceremoniously at 3 A.M. This disgust was due, H considers, to the fact that she cared nothing for the man and that sexual rela-

tions without love have always seemed vulgar and loathsome to her.

In September, 1912, H obtained position as agent for library of Children's book with which she had fair success and at which she worked until February, 1913. H met W. H. about September 20, at which time she was greatly worried over her financial troubles and treatment by E. C. E. C. upbraided her severely for getting into debt, for drinking, smoking, and being unconventional, etc. This had led to marked coolness between them. An attempt by H at suicide was accidentally discovered and frustrated. H was at once attracted by W. H., who was 12 years older than she. W. H. was small, very fair, with soft brown eyes; she was very intelligent and well educated, came of a prominent Southern family, had been reared in wealth, and had traveled abroad extensively. The attraction was mutual. They spent as much time together as possible during the fall. W. H. had always been very popular with men and was engaged when she met H. This was soon broken off, however. Tacit lovemaking began in a few weeks. They made several trips during the fall to P—where they went to shows and cafes, drank and celebrated generally. Finally, in December, 1912, while spending the night with W. H., quite without premeditation and hardly realizing what she did, H proposed that they plan to live together permanently and have a home; to this W. H. assented at once. H was stunned and miserable when daylight came to discover to what she had committed herself, as she felt bound in honor to E. C. However, she could see no way of escape from her dilemma. W. H. was intensely jealous of E. C. and now set about separating E. C. and H., which she accomplished during the winter and spring. H now wrote only occasionally to E. C. and these not love-letters. W. H. was also very jealous of H because she and her friends were younger than herself. H. and W. spent much time together—together practically every night after February, when H secured work in town where W. H. was located. The sexual nature of the relation was recognized by both. The method used was tribadism and that in excess. However, this only seemed to have a good effect on H, who had boundless energy and strength and gained steadily in weight. W. H. assumed management of H's salary, so that H was able to pay many old bills. First, H was in a real-estate office, and then was accountant and general utility man in a wholesale and retail meat business. In her spare time she did typewriting, polished floors, waxed furniture, painted woodwork, built furniture and window-boxes, etc. With economy,

gradually got most of the debts paid, but had no estate left for professional education. During spring, W. H. had guest I. C., an attractive red-haired girl who was a remarkable pianist. H thought her very sweet and attractive. During the summer, H spent every week-end with W. H. Also spent one week at E. C.'s home only to find all the old attraction gone. Had a furious reckoning with W. H. for this visit. H and W. H. spent about two weeks at shore in September, during which time they became reconciled and returned to former status. H borrowed some money through W. H. and entered medical school in the fall of 1913. Plan then was to establish a permanent home together after H was started on her profession. H found in this relationship that bodily contact and rythmical motion sufficed for her own complete pleasure. W. H. enjoyed the sexual relation as much as did H. A night rarely passed without gratification. H's attitude was entirely masculine. Each felt that the inability to have a family of their own was the only drawback, so they planned to adopt a boy and a girl. There was an engagement ring to signalize the contract. Spent almost all their time together in lovemaking. H always attended to all business matters when they were together and both considered her position as absolutely masculine. Often the mere sight of W. H. or her belongings would produce intense excitement in H, who always ardently welcomed contact with W. H. Sometimes she would allow W. H. to assume initiative in lovemaking, but this always resulted in such intense excitement for H that she would seize W. H. and go on to the orgasm without waiting. W. H.'s attraction for H was almost purely sexual.

H was the only woman in her class and had a rather severe initiation. Much interested in work, studied hard, seldom went out. Forced to practice rigid economy. Lived with a woman several years older than she in an apartment; they were good friends but there never was a trace of sexuality in the friendship. At first was very lonely for W. H. and went to see her every two weeks. Then I. C. began to be very kind to H and they saw a good deal of each other. H always thought of I. C. as inferior mentally, but companionable and lovable. Liked to go to the theater with her and lounge before the open fire in the evenings in I. C.'s home while she played. H took to spending almost every Saturday evening and Sunday with I. C.; this lasted all winter and spring. Between them there was lovemaking and kissing, which I. C. seemed to enjoy greatly. This caused sexual excitement in H but there was never any actual relationship between them. H took the masculine rôle

here so completely that I. C. often said going about with her was exactly like going with a man. H assumed the small gallantries and courtesies of men. H often dreamed after retiring of courting and marrying I. C.; also visualized actual intercourse with her as a male; this was accompanied by sexual excitement and masturbation. W. H. was extremely jealous of I. C.; wrote much about her to H; they had many "scenes" over it. H now began to resent W. H.'s holding her so strictly to account and distrusting her in general; her ardor for W. H. had now cooled markedly, except when in actual physical contact, when sexual excitement would always occur.

E. C. was in same city as H in May, 1914. H had not written to her all winter, but when they met there was a complete confession of everything on H's part and a reconciliation. In the next month, W. H. and H completely broke off their relations; W. H. felt very bitter over this. H spent most of the summer working in the mountains, was with E. C. a good deal; everything seemed to have settled back to the old level between them with moderate sexual indulgence.

In spring of 1914, a male fellow-student made advances to H in a laboratory in the college. This was a complete surprise to H, who was very angry and departed hastily. Further advances were always repelled though sometimes pressed with considerable violence by man. H is a friend of this man, likes many things about him, finds him mentally congenial, but is always disgusted when he attempts contact or familiarity. The man is bestial and outspoken in his passion. H is a friend of his wife and disapproves thoroughly of his neglect of his family. H does not believe that any relation between them now would be possible.

During second year in medical school, there was complete reunion between E. C. and H. The former was working in another locality, but H wrote ardent daily letters and visited her at Xmas. H saw a good deal of I. C. too, but there was nothing more serious there than "spooning." In the spring of 1915 I. C. left the city; H has not seen her since and does not correspond with her. During the year H met also E. H. C., who was a tall, fair, stylish girl with plenty of energy and life and a decided fondness for men. They became warm friends and were closely associated for several months. There were a number of men who used to come to their apartment for "dutch feeds" and "beer parties"; these were always jolly, unsentimental affairs totally devoid of any illicit happenings. There was then no trace of the sexual that H was conscious

of in her friendship for E. H. C. But, in September, 1915, H visited E. H. C. in her home and found herself extremely jealous of a young man who was paying marked attention to E. H. C. Since then H has felt a strong attraction to E. H. C. but has always inhibited it so there has never been more than a goodnight kiss between them. There exists between them a genuine friendship outside a sexual basis. On one occasion when they were discussing which of them should do a certain errand, E. H. C. said, "O, you go do it, you're more like a man than I am, anyhow."

H spent a part of the summer with E. C. and began to realize that they had drifted so far apart that she would never be able to feel for E. C. the same passionate love as formerly. However, she thought it best to go on in the same relation with her if possible. The sexual part of the relation had been largely superseded. To H's consternation, when she spent Thanksgiving and Xmas with E. C. she found her society dull and boring and very little attraction left. Companionship was impossible because they had different ideals and viewpoints and standards. Many things about E. C. that had once been attractive H now thought childish and silly.

During the following school year, there were only two transient flirtations—one with a girl whom H treated professionally and another with a waitress. During May a visit with E. C. brought H almost to the verge of distraction; she could no longer care for the girl and yet E. C. loved her and begged for the old love in return. They parted after a week's visit in uncertainty. E. C. heartily disapproved of H's manner of dressing, her freedom with men, her disregard for conventionality, her drinking, swearing and smoking. During the ensuing summer H wrote to E. C. only a few times and these were not love letters.

In May, 1916, H met Mrs. D. at a boarding house where she had moved. Mrs. D. was a beautiful young woman, who was unhappily married. She had one child, a boy $2\frac{1}{2}$ years old. Her husband had gone to another city to locate, and she was to join him later. H felt at once a very strong attraction for Mrs. D. but avoided her, fearing to get entangled with her. Forced to spend a night with her by circumstances, H succumbed to temptation and made violent love to the lady who—much to H's surprise—responded warmly. Afterward Mrs. D. confessed to attraction to H as soon as they met. One evening, before anything had passed between them H sat beside her on the couch with her hand on Mrs. D's ankle. H was at the time feeling an intense sympathy for her. Mrs. D. later said that she purposely remained on the couch for a

long time so as not to disturb this contact, finding it enjoyable. After one week's ardent lovemaking—during which no sexual relations were established, although both were sexually excited—H left for a distant city for a summer's work. While there she wrote daily ardent love letters to Mrs. D., and received almost daily ones in return, in which the expressions of love were more restrained though unmistakable. While in this city H heard many lectures by Emma Goldman and became much interested in anarchism. In the fall, when H saw Mrs. D. again, she was more madly than ever in love. They spent four days together in the country early in the fall that were packed full of most ardent, tender love. Even yet, however, there had been no intercourse between them, though both became highly excited. During the autumn, they were much together, H's infatuation increasing all the while. An elderly wealthy man who had divorced his wife also became interested in Mrs. D. The most intense jealousy existed between H and this Mr. R. Mrs. D. at H's instigation set about securing a divorce now, and this was accomplished at Xmas. During October and November actual sexual relations were established between them; these occurrences were infrequent, about once in two weeks, and accompanied by the most passionate excitement and orgasms in each. They were prefaced by all the arts of lovemaking that H knew—kisses, caresses, fondling of the body, titillation, etc. The *modus operandi* was the traditional one between the sexes except that the hand was substituted for the *membrum virile*. During this excitement, Mrs. D. would call H "Dear boy" unconsciously. Mrs. D. professed to find complete gratification and much more enjoyment than with her husband. H proposed going to an eastern city together, where she could establish herself in practice and Mrs. D. could engage in some business until they were on their feet; after that she proposed to support Mrs. D. and her child and let her live her own life if she would see H several evenings a week and spend a night with her now and then; H did not ask to be allowed to live with Mrs. D. However, Mrs. D. decided she could not do this and "threw H overboard" shortly after receiving her divorce. It is noteworthy that B., Mrs. D's child, was very fond of H but that he was also jealous of her relations with his mother and noted the caresses and kisses that passed between them when he was about. During the spring Mrs. D. left the city and H saw her only once after their break until May, 1917. In the meantime Mrs. D. had become engaged to the elderly man, Mr. R., whom she wanted for his money.

H had been frantic all fall with the fear of losing Mrs. D., neg-

lected her work to be with her, spent all her money on taking her about to all functions possible. She also began to drink rather heavily. In January, after there was no hope of Mrs. D's doing as she wished, she began to drink more heavily than ever and became sunken in the depths of despair. She considered suicide very seriously, brooded incessantly over Mrs. D's faithlessness, neglected her work, came very near running away from everything to parts unknown. Vowed never to love another woman. Spent all her time in incessant activity; went about to all the shows, etc., and was never alone when she could help it. Moved into a residential hotel to be near some friends of hers. At this hotel, saw a very attractive young woman in whom she knew she could get interested; consequently, fearing another heart-break, she avoided this girl sedulously. In May Mrs. D. returned to the city. H saw her a few times; by this time she had acquired enough self-control not to go off her head during the interviews. The physical charm of the woman was as potent as ever, but H found that she could not respect Mrs. D., who was planning to marry a man whom she did not love, for his money. Mrs. D. also confessed that she loved H very sincerely but did not have the "nerve" to face the criticism that would follow the union; she said her friends and associates had already ridiculed her severely on H's account. However, each time H saw her there was mutual lovemaking and, upon one occasion, sexual relations. When they parted in June, Mrs. D. wept and said her heart was broken. H has not seen her since.

H was graduated from medical school in June with the highest honors in her class. She at once took up hospital work. In August she underwent a complete physical examination, with subsequent laparotomy in which the uterus was removed. After the operation, she assumed male attire.

H had known for some time that she was "not like other girls," but her condition seemed so natural to herself and she was so strong and healthy that she gave the matter but little thought. However, her mode of dressing—men's coats, collars, ties, tailored hats, English shoes, etc.—made her conspicuous and the object of so much criticism and conjecture as to make her very uncomfortable. When her skirt was hidden in any way, she was often mistaken for a man.

During her second year in medical school, H found out through perusal of various professional books her true condition. At first she was plunged into self-condemnation and misery, but very soon came to take a saner view and face her problem as best she could.

In the spring of 1917 she consulted a physician-psychiatrist who tried psychotherapy to no avail.

SIDE-LIGHTS

From early youth H has had the habit of saying such things as "The other fellows and I," "What could a fellow do?"

H has always enjoyed managing things, buying tickets, checking baggage, paying bills, tipping servants, carrying packages, opening doors, etc., for women she is with.

ABILITY TO PASS FOR A MAN

1. H was in habit of wearing men's clothes to masquerade parties, etc., when in college. Always looked well and natural in them. Was once almost ejected from a girls' party when masking in a wig and dress-suit.

2. In the course of her photographic work in mountains H always wore men's clothes, and would often pass with many people for a boy. Had an actual fist fight with one old man who thought her a boy.

3. Wore men's clothes on a long motor trip in 1916. Was mistaken by many for a young man until the long hair came into evidence.

4. Mistaken for a man in Y. W. C. A. gymnasium and hastily ejected before error was discovered.

5. Photographs taken of her in her usual clothes in 1917 have been taken for those of a man by numerous people who did not know her. Her friends have commented on the masculinity of the pictures also.

6. A close friend in 1917 remarked to H on her boyishness of voice and action, saying that the combination of an adult mind with such youthfulness was most unusual in a woman 26 years old. The same lady resented H's way of looking at her extremely low-necked waist and said she would leave the table if H did not stop it.

7. H, upon seeing a crowd of men standing on a corner on a very windy day laughing at the women who were trying to cross the street, resented their amusement and yet had an impulse to do the same thing.

8. Waitress at H's hotel in 1917 said that she would fall in love with H if only she were a man.

9. H made a pleasure trip in 1917 with a young woman friend; she registered at the desk of a hotel as Miss——— pp and

Dr. H." There was considerable difficulty in persuading this functionary that everything was all right.

10. Many kodak pictures of H have been exhibited as those of a man without being questioned.

TREATMENT

As is well known, such a history renders the prognosis rather gloomy, so far as correction of the difficulty is concerned. However, we decided not to evade the issue but avail ourselves of whatever means we could command. Suggestive therapeutics in the hypnoid state proved unavailing. Complete hypnosis was also resorted to without satisfactory results. It was impossible to induce the deeper stages of hypnosis.

A number of things militated against the efficiency of suggestive therapeutics, chief of which was her own mental attitude with reference to the female sex as a whole. At the start, she entered with a will into the correction of the difficulty, if such were possible. One day, when she came to the office, she said she had been thinking the affair all over and would like to ask several questions before continuing treatment further. The main query in her mind was as to whether correction of the difficulty as psychologically pathological would deprive her of her masculine ambitions and tastes with a consequent substitution of the characteristics common to the female. She had an utter loathing of the female type of mind. It can readily be seen that no predictions could be offered or promises made to such a query. Failing to get any definite assurance as to what would constitute success in the treatment we were undertaking, her enthusiasm waned and she absolutely refused to run any chances of losing her general masculine psychological characteristics in exchange for any benefit that might be derived from a proper orientation of herself as a female sociological unit in the social world of sex. It can be readily seen that it was not only impossible to make any definite predictions as to what suggestive therapeutics might accomplish, but the circumstances of the case threw one into a somewhat confused state of mind when he tried to figure out just what results were desirable and to justify the application of suggestive therapeutics in such a psychological muddle. I am free to confess that the case presented the most difficult problems of any that ever entered my office. What to do for the girl or what to advise her to do offered a riddle, the solution of which is still unsettled to a large degree. With apologies for the treason to the

underlying principles of psychotherapy involved in the mental attitude with which I undertook the treatment, "just as I expected," suggestion was a failure.

After treatment, aimed at the pathological condition as such, proved itself unavailing, she came with the request that I help her prepare definitely and permanently for the rôle of the male in conformity with her real nature all these years. This suggestion fairly bristled with difficulties.

Physical examination revealed predominance of the female type with deviations sufficiently marked to attract attention. The whole tendency of dress was toward male attire, retaining, however, the skirt as the trade mark of femininity. She was repeatedly taken for a man when the skirt was hidden from view. Male hose supporters, male socks, pajamas for night dress, tailored suits which would afford numerous pockets, male type of hat, and even the cane were adopted, not as artificial concessions to mere personal idiosyncrasy, but as natural components of her normal make-up. The hips, while relatively larger than would conform to the strictly male type, still fell short of the average female contour. The breasts, when in standing position, presented nothing to suggest deviation from the female type, except, possibly, an unusual flabbiness. However, on lying down, they flattened out and practically disappeared. Palpation revealed complete absence of any glandular tissue in the upper halves of the breasts. Patient says they are undergoing atrophy. Vaginal examination revealed practically normal conditions in the pelvis. However, digital examination caused an unusual amount of pain and the process produced disgust as well as pain and distress. The clitoris was abnormally large and patient stated that, at times of sexual excitement, it presents turgescence and throbbing to the point of distress. Menstruation was always painful and has been gradually decreasing in duration. Now lasts from two to three days.

After long consideration, she came to the office with her mind made up to adopt male attire in conformity with her true nature and try to face life under conditions that might make life bearable. Suicide had been repeatedly considered as an avenue of escape from her dilemma. Preliminary to the adoption of male attire she came to me with the request that I remove her uterus with two definite ends in view, viz: (1) to relieve her of the dysmenorrhoea and the inconvenience of dealing with the flow in male attire, and (2) to sterilize her. Inasmuch as pregnancy was a very remote possibility sterilization assumed less importance than the other item, though

both ends were obtainable by the same process. Between the two operations of oöphorectomy and hysterectomy there is but one choice, for reasons too well known. She realized and urged the advisability of sterilization of herself as well as of any individual, afflicted as she was. Sensible to the extreme, she accepted her condition as one of abnormal inversion and was ready to face the affair on its merits. After long hesitancy and deliberation on my part, the only rational course seemed to be the adoption of the procedure, which was accordingly carried out. Hysterectomy was performed, her hair was cut, a complete male outfit was secured and having previously identified herself with the red cross, she made her exit as a female and started as a male with a new hold on life and ambitions worthy of her high degree of intellectuality. Having an "M.D." degree she applied for and was appointed to a position in a hospital where she "made good" in every way until she was recognized by a former associate under the operation of that fanciful law of chance which threw one of her former intimate associates across her track. Then the hounding process began, which our modern social organization can carry on to such perfection and refinement against her own members.

Destructive criticism is always easy. Let him who finds in himself a tendency to criticize offer some constructive method of dealing with the problem on hand. He will not want for difficulties. The patient and I have done our best with it.

ADDENDA

The above history has been withheld to date in order to give opportunity for any further developments that might be essential to the completeness of the picture as a whole. The case has now settled down into what may be looked upon as a permanent adjustment to existing social conditions, so far as that is possible. Her natural male instincts carried her into associations with the female sex and positive attractions were unavoidable. Women of normal sex life felt themselves attracted by her because of her aggressive male characteristics. One, to whom she is now married, fell in love with her because of her psychological characteristics.

Legal aspects of the affair were taken up with the most competent legal advice obtainable. Being in time of war, the chance of the draft came up as a strong possibility. This was arranged to meet the requirements of the law and precautions were taken to afford relief in case of embarrassing complications. The illegal

aspects of male attire in public were also met by legal authority and the final step of marriage was taken in order to complete the picture of normal life, so far as such is possible under the conditions detailed above. This feature of the affair was the most doubtful of the whole program and it received my protest, though I must confess that my protest was indefensible except on grounds of a prejudice and a habit of thinking begotten of long years of conformity to social dogmata, most of which are indefensible. At any rate, it was done—possibly for the best. There are certainly numerous and rational arguments in defense of the procedure.

In the interest of brevity, let it be stated that she is now married to a normal woman of high degree of mentality and decided physical attractions. All parties to the deal were fully cognizant of all the facts involved before entering into the contract and they now have a home apparently happy and peaceful based upon psychological attractions with such ministration to the physical as existing conditions can render possible.

She is now practicing her profession in a neighboring state in male garb, making good as a man and known only as a man. In fact, from a sociological and psychological standpoint she is a man.

If society will but let her alone, she will fill her niche in the world and leave it better for her bravery in meeting the issue on the merits of the case as best she knew. Instead of criticism and hounding, she needs and deserves the respect and sympathy of society, which is responsible for her existence as she is.

REPORT OF AN UNUSUAL CASE OF LETHARGIC ENCEPHALITIS¹

BY JULIUS GRINKER, M.D.,

ASSOCIATE PROFESSOR NERVOUS AND MENTAL DISEASES, NORTHWESTERN
UNIVERSITY MEDICAL SCHOOL CHICAGO

While the pathology and bacteriology of epidemic encephalitis is still largely a matter of discussion, the various disease pictures are beginning to be known. Owing to the fact that the inflammation may affect almost any portion of the central nervous system, there will be different symptom-complexes depending on the localization. And while the disease commonly affects the region of the basal ganglia in the brain, it may involve portions of the cortex, even the meninges and not infrequently the pons-medulla. Because of the diversity of symptoms found in the numerous varieties of the disease, diagnosis is far from easy. In the description of the course of the disease with its attendant symptomatology, great stress has been laid on the fact that it is an encephalitis, that is, an inflammation of the brain proper. This is true in the majority of cases; there are instances, however, in which the pathologic processes recognize no limitations, but extend down into the cord, involving the anterior horns with preference. Such cases are considered rare, and some have doubted their existence, preferring to class them among the poliomyelitis group. The case I am reporting demonstrates the possibility of the disease called encephalitis lethargica becoming a case of *polioencephalomyelitis lethargica*. In this case also occurs another exceedingly rare phenomenon, namely, the development of an optic neuritis, a symptom which I have observed once in a case of poliomyelitis, but never in an epidemic encephalitis.

My excuse for reporting a single case is the comparative newness of the disease and the baffling symptomatology in this particular instance.

Case.—The patient is a nurse in training at the Chicago Postgraduate Hospital. Age, 21, married; negative family history, excepting that father died at 52 of heart disease. Usual diseases of childhood—measles, scarlet fever, pertussis—are recorded. No menstrual disorders.

¹ Read before the Chicago Neurological Society, March 25, 1920.

About a year ago the patient passed through a severe attack of influenza, which left her somewhat debilitated; after a few weeks she returned to the hospital.

On the evening of February 13, 1920, patient complained of a slight headache over the right frontal region. Next morning she awoke, apparently in good health, did some housework and left for the hospital. Within an hour after her arrival at the hospital she became cyanotic, developed stertorous breathing, vomited, and her pulse became weak, irregular and rapid. When put to bed it was discovered that her pupils did not respond to light stimuli and that there was a convergent strabismus. The neck muscles were stiff and there was a complete left-sided hemiplegia, involving the leg, arm and lower portion of the face, as well as the tongue. At this time the tendon reflexes were absent on the left and present on the right side. This account of symptoms was furnished by the husband, a physician.

An examination made by me on February 14, the day after the apoplectiform attack had occurred, revealed the following: Complete left-sided hemiplegia, involving both upper and lower extremity, as well as the lower half of face. The knee and Achilles reflexes on the left side were accentuated and Babinski and Chaddock signs were well-marked on the same side. No other parts of the body were affected, except the eyes which showed a slight strabismus (convergent).

The patient appeared drowsy, apathetic and listless, keeping the eyes closed most of the time. She answered questions intelligently when urged to respond. There was no attempt to begin a conversation, nor was there any desire to continue the same when once begun. Though apparently indifferent to her surroundings, she understood everything and her replies were to the point. To use Foster Kennedy's phrase, she was "intellectually keen, but emotionally stupid." The mental state as described lasted a little over four weeks; gradually she began to take an interest in her environment and at the present time is very much awake.

The ocular findings were those often described in encephalitis lethargica, namely, transient diplopia and strabismus. Even at this time—six weeks after the beginning of the disease—there is occasional diplopia due to a paretic condition of the left sixth nerve.

The blood examination made at varying intervals, having in view especially the degree of leucocytosis, gave the following findings: Leucocytes, on February 14, 24,950; on February 15, 15,250; on February 18, 9,350; on February 23, 16,550; on March 8, 11,450; on March 12, 8,950; on March 16, 7,050.

The Wassermann test made on blood and spinal fluid was negative.

The spinal fluid was under tension and somewhat blood-tinged, but microscopic and cultural examinations yielded negative results for microorganisms.

The temperature was never high, the maximum 101° F. Since March 2 there has been no fever. The pulse has been rapid most of the time, fluctuating between 95 to 120.

With exception of the complete hemiplegia, coming on as in this case suddenly, the symptoms thus far enumerated have been repeatedly mentioned in connection with the diagnosis encephalitis lethargica. The symptoms which I am about to report are exceedingly rare in this disease, indeed, they are such that because of them some doubt might be cast on the diagnosis.

The optic nerve, examined on the third day of the disease, presented the appearance of a hyperemic disk—the vessels were engorged, there were no hemorrhages and the neuritis was not established. Within one week from the onset, there was definite optic neuritis, intense within the next few days and persistent up to the present. During the past week the appearance of the disk has changed somewhat—there are to be seen whitish areas denoting scar formation and there is better definition. One can readily discern regressive changes from day to day, namely, improvement.

Another unusual symptom, observed only in the polioencephalomyelitic type of the disease, and not classed under the lethargic type, was the development of muscular atrophy in face and upper extremity.

About ten days after the beginning of the disease I discovered a left-sided facial peripheral paralysis, involving all the branches of the seventh nerve, upper as well as lower. It may be recalled that I had already described the typical central facial palsy in connection with the left-sided hemiplegia. The peripheral palsy was so to speak engrafted upon the central facial palsy.

In addition to the peripheral or nuclear palsy of the left half of the face, there were noted within a few days a certain flabbiness of the muscles of the left upper extremity, instead of the expected spasticities because of the central paralysis. This finding led me to look for atrophies in the muscles which showed flaccidity. Two weeks after the first symptoms of the disease became manifest, wasting of the forearm and hand muscles of the left side was pronounced. The atrophy of the forearm muscles is present in flexors and extensors, but more marked in the latter. The biceps is some-

what reduced in volume and feels flabby; the triceps is only slightly affected. The palm of the left hand is hollowed out, atrophied. The left thumb and thenar eminence presents a picture resembling the Aran-Duchenne type of progressive muscular atrophy. There are no disturbances of sensation anywhere. The triceps reflex is somewhat reduced on the left side, while the wrist reflex on the same side is completely lost.

Course of the Disease.—Improvement occurred rapidly in the paralyzed muscles, beginning in the lower extremity, which the patient is now able to raise from the bed. Even in the paretic upper extremity a marked improvement was noted a few days after the hemiplegia had developed; however, this improvement was only of short duration, for soon the peripheral paralysis abolished all motion in the parts. At present the patient is again able to raise her left arm by resorting to a trick well-known to the poliomyelitic patient, namely, by slowly crawling up on her chest by the use of the inner muscles of the forearm.

The left-sided facial palsy is still present, showing its peripheral character by the involvement of all branches and the absence of the McCarthy reflex. There is marked improvement in this as well as in the tongue paralysis, which latter has retained its central character.

The left external rectus still presents considerable weakness, best seen when patient attempts to look to the left—then diplopia promptly occurs.

Of subjective symptoms, the headache very troublesome at first and almost constantly present on the right side of the head, is still in evidence at times. On the whole the patient is happy, takes an interest in everything about her and begs to be taken home.

The features of great interest are:

1. Beginning with symptoms of cerebral hemorrhage, as cyanosis, stertorous breathing, vomiting, convergent strabismus and hemiplegia of the upper motor neuron variety.

2. Lethargic state with drowsiness lasting about four weeks.

3. Development of peripheral nuclear palsies in face and upper extremity on the side previously attacked by a central upper motor neuron paralysis.

4. Optic neuritis, slight at first, gradually becoming more intense, then receding and showing secondary optic atrophy.

5. Babinski and exaggerated reflexes persisting in the left lower extremity, while the triceps reflex is reduced and the wrist reflex lost on the same side.

Conclusion.—The case reported must be differentiated from

hemorrhagic encephalitis, polioencephalomyelitis, cerebrospinal lues, and brain tumor. The Wassermann on blood and spinal fluid were negative and clinical signs of lues absent—findings making that diagnosis improbable. A radiogram for evidences of brain tumor, with special emphasis on the sella and the posterior fossa, gave no clue to such diagnosis. There remain for practical consideration only epidemic polioencephalomyelitis and epidemic encephalitis of the lethargic variety. Though lethargy and encephalitis symptoms were present in this case, we are not dealing with an encephalitis only, but also with a poliomyelitic syndrome, in other words, *polio-encephalomyelitis lethargica*.

25 E. WASHINGTON ST.

THE CEREBROSPINAL FLUID IN EPIDEMIC ENCEPHALITIS¹

BY PIERO BOVERI, M.D.

PRIVAT DOCENT OF THE UNIVERSITIES OF PAVIA AND TURIN; FORMERLY DIRECTOR OF
THE FIRST SECTION OF THE NEUROLOGICAL MILITARY CENTRAL HOSPITAL,
MILAN

Having had the opportunity of following day by day the different symptomatology which encephalitis patients may offer, I consider it of a certain interest to refer the result of our researches of the cerebrospinal fluid. And this all the more since the opinions of authors differ greatly in this question. Sixteen cerebrospinal fluids were examined; thirteen belonged to cases of the classical type of lethargic encephalitis, and all presented an almost identical symptomatology; two were of the myoclonic type, i.e., of Dubini's chorea type.² One case only presented a mixed form, in which, after a lengthy period of mental and ocular symptoms (ocular ataxia particularly) there followed a period of sleepiness, with anisocoria, etc.

The cerebrospinal fluid was examined at different periods of the disease, from the fifth to the thirty-fifth day, so that it would have been easy to discover any change in relation to the phase of the disease. As to age, we had patients between fourteen and sixty; as to sex, twelve were women, four men. Of the sixteen, seven cases ended fatally, nine recovered.

I will only briefly state the conclusions come to by our researches.

Pressure of the Fluid.—It was found in eight cases slightly increased, in as many other cases normal. The increasing of the pressure does not seem to have any relation to the seriousness of the case, whereas it seems to have a connection with the period of the disease itself. Such alterations are more easily found in the beginning and up to the maximum height of the disease. It decreases and disappears in the third and fourth week of illness. But, as I have said, the increased pressure, when present, is always slight; no strong hypertension was ever found.

¹ From the *Ospedale Maggiore of Milan*, Medical Section of Dr. Ronchetti, delivered before the Biological Society of Milan, April 16, 1920.

² P. Boveri, *Encephalite epidemique et chorée de Dubini*, Soc. de Neurologie de Paris, Séance du 1 Avril 1920, and "The Myoclonic Form of Epidemic Encephalitis," *British Med. Journal*, April 24, 1920.

The *color* of the liquid is always clear, like pure water, so that, as to coloring and transparency, the cerebrospinal fluid in epidemic encephalitis may be considered as quite normal.

No fibrinous deposits were ever found in these fluids on standing, so that we may state that the web test (Mya) is constantly negative.

As to *albuminoids* (albumin and globulin), which are always found together, the one never being present without the other, as Mestrezat writes, they were searched for with Sicard's Rachialbuminomètre, by Nonne's method, and with Boveri's reaction (permanganate). With Sicard and Cantaloube's Rachialbuminomètre, in the majority of cases, normal figures were found (0.10, 0.15, 0.22 per cent.), or very slightly increased (in two cases, 0.25 per cent.).

Nonne's method was positive in four cases. Boveri's reaction showed a liquid not quite normal in seven cases, this reaction with permanganate being much more perceptible than Nonne's.

We may thus state that, as to albuminoids, the cerebrospinal fluid in epidemic encephalitis is often altered, but in a very slight way, as we never could obtain a strong positive reaction.

The *reducing power* was found lessened in one case (myoclonic type), increased in eleven cases, normal in four cases.

These figures show that, in general, there is increase of the reducing power of the liquid, but we can not agree with Laport and Ronzaud, who have recently stated that hyperglycorachie is present in *all cases* of epidemic encephalitis.

The *cytological examination* was made with Nageotte's counting chamber and two to fourteen lymphocytes per cu. mm. were found.

Therefore the same may be stated for lymphocytes as to pressure: any alteration, when present, is more usually found in the initial period of the disease than in following periods.

Generally the slight lymphocytosis and hyperalbuminorachie follow *pari passu*; but there is no constant and exact connection between the increasing of the albumin and the increasing of the leucocytes. In fact, there may be a dissociation of the two, either to the advantage of the one or the other.

All these factors being slight, they can only be detected by most accurate examination, otherwise they may easily pass unobserved.

We are very far from the contrast of strong albumino-cytological dissociation described for the first time in France by Sicard in cases of medullar compression, and by myself in the chronic saturnism.

The leucocytosis was found in twelve cases, with very low figures: 4 to 6 per cent.

As summary of our researches we can state the following propositions:

1. The cerebrospinal fluid in encephalitis patients is not to be considered normal.

2. The alterations of the liquid are always slight either in connection with the cytological examination or in connection with the presence of albuminoids, and with reducing power.

3. In all phases of the disease the liquid always shows the same slighness of alterations; in its initial phase, however, it shows its anomalies more easily.

4. The different clinical types of epidemic encephalitis (lethargic form, myoclonic form, mental form) show no particularly characteristic cerebrospinal fluid.

5. The slighness of the alterations and their uniformity in all phases of the disease are facts of great importance, especially in view of diagnoses of epidemic encephalitis, so that it may be possible to differentiate this disease from the different forms of meningitis, particularly from tuberculous meningitis and syphilitic meningitis.

Society Proceedings

THE PHILADELPHIA NEUROLOGICAL SOCIETY

REGULAR MEETING, MARCH 26, 1920

The President, DR. S. D. INGHAM, in the Chair

SPINAL CORD TUMOR AT LUMBAR ENLARGEMENT

DR. J. HENDRIE LLOYD showed a patient forty-three years of age, who had had a chancre nineteen years previously. He had always been well. The present difficulty began with weakness of the right foot accompanied by burning sensation in the toes. Foot drop then developed and fibrillary tremors in thigh muscles, dysuria and sacral pain showed. Both legs then became exquisitely hyperesthetic, this manifestation replaced later by anesthesia and paresis of bladder and rectum with a complete paraplegic picture at the end of six months. Wassermann tests of the cerebrospinal fluid were negative.

Autopsy revealed a large medullary growth of the lumbar enlargement, with extension of an infiltrative process in the retrolumbar lymph nodes. A marble sized growth was also found in the right cerebellar lobe. Histologically the process was tuberculoma according to Dr. B. L. Crawford who reported no tuberculosis and had not stained for spirochetes. Dr. Lloyd was inclined to believe the process a mixed one, gummatous and tuberculous, a coexistence which though rare nevertheless was known.

Discussion.—S. LEOPOLD thought the growth a tuberculoma, W. G. SPILLER also argued for the extreme rarity of isolated medullary gummata saying that in a collection of eight hundred specimens not a single tumor of that type has been seen, whereas the tuberculomata were quite common and resembled the specimens presented.

THE CLINICAL INVOLVEMENT OF THE PERIPHERAL NERVES IN DIABETES MELLITUS

DR. WALTER M. KRAUS, of New York, presented the results of a statistical survey of four hundred and fifty case reports of diabetes mellitus. These reports were selected from nearly seven hundred accumulated during ten years at the Metabolic Department of the Vanderbilt Clinic.

New York. The discussion was limited to those cases having involvement pointing to disease of the spinal cord or peripheral nerves.

The symptoms and signs considered were:

1. Areflexia.
2. Neuralgia.
3. Ulceration and gangrene.
4. Pseudo tabes.
5. Spinal cord disease.
6. Herpes zoster.
7. Peripheral neuritis.

Absence or diminution of knee reflexes, on one or both sides, was found in thirty per cent. of the cases. Exaggeration ten per cent.

The Achilles jerks were absent in sixty-four per cent. of the cases tested (eight per cent.).

Age, sex, race, nutrition (determined by the loss of weight and the weight divided by height index at the time of examination) the duration of the disease, the condition of the arteries, the level of the blood pressure and the presence or absence appear to play no part in determining hypo- or areflexia.

The severity of the disease as determined by the course and carbohydrate tolerance, seemed to play a part since knee reflexes were absent in twenty-two per cent of the mild cases, thirty-three per cent. of the moderately severe cases and fifty per cent. of the severe cases. Neuralgic pains were present in the extremities in about twenty-five per cent. of the cases.

A group of cases showing objective changes in light touch sensation, reflexes and with some neuralgia, were not uncommon. These are due to spinal cord involvement—the intramedullary portion of the posterior roots. This was shown pathologically by Williamson, Kalmus, Schweigger and others. These cases are not neuritis and should not be spoken of as a "peripheral neuritis." Peripheral neuritis in diabetes is very rare. None of the pathologically reported cases were true sensorimotor peripheral neuritis. In the seven hundred cases at the Vanderbilt Clinic none were such except the single case of a patient who was also an alcoholic. This is striking. The coincidence of alcohol in those few cases showing peripheral neuritis is emphasized by all writers on the subject. It seems therefore that true peripheral sensorimotor neuritis is either a very great rarity as a sequel of diabetes or is never a sequel, but must be attributed to an intercurrent condition other than diabetes.

Ulceration and gangrene occurred in very few cases, herpes zoster in none.

The cases showing absence or diminution of deep reflexes, sensory changes in the skin, neuralgia, ataxia (diabetic pseudo tabes) can all be explained anatomically by a partial lesion of the intramedullary portion

of the posterior root. The changes in the posterior columns follow. Gangrene may have the same origin. Herpes zoster and peripheral neuritis appear to be rare conditions in diabetes and not dependent upon it as a sole cause. Diabetes may predispose to these conditions, but does not cause them. [Author's abstract.]

Discussion.—DR. W. B. CADWALLADER believed the clinical evidence pointed to a general radicular process quite dissimilar to the myelitic changes noted in pernicious anemia to which latter process the reader of the paper had referred it. Dr. Kraus called attention to the intramedullary involvement of the root fibers pointed out by Williamson of England.

PARIETAL TUMOR

DR. J. H. W. RHEIN presented a colored man, forty-nine years of age, with negative previous history. Seven years ago he had been struck on the parietal region by a club. Two years later a small tumor grew there and rapidly expanded. Two years ago patient had a generalized convulsive seizure followed by confusion, and paresis of right side, including the motor speech mechanisms. Later twitching of face, numbness of right side and paresis of foot and speech musculature were apparent. These would come on in attacks averaging two a month. Parietal pain was evident at these times. In 1918 he had a second generalized convulsion, a third in 1919 and another in October of that year. Weakness of the right side and twitchings were continuous and the speech was disturbed and orientation involved.

In November, 1919, his eye sight began to fail and he had pain in parietal region and difficulty in recalling words. Neurological status at that time showed slightly enlarged right pupil, prompt eye reflexes, normal eye grounds, no other cranial nerve signs. Weakness and astereognosis of right hand, with hypermetria, accented knee and ankle jerks of right side, slight hemiplegic gait; x ray examination revealed large shadow of right parietal side 6 by 4 inches, chiefly osteitic in character with softened areas. Nearly positive Wassermann reaction.

Later attacks were observed in 1920 with increasing involvement of cranial nerves, facial paresis, hemianopsia, right homonymous, speech involvement and increasing hemiplegic signs, apraxic and agaphic syndromes. No results following antisyphilitic treatment diagnosis of bony sarcomatous growth was made. Surgical intervention was advocated.

Discussion.—J. H. LLOYD spoke of the extension of pressure as explanatory of the hemianopsia.

C. W. BURR spoke of the good results from radium treatment in a somewhat analogous case.

S. D. INGHAM explained the absence of choked disc as due to the spontaneous decompression due to the eroding tumor mass.

ORBICULARIS TIC

T. A. WILLIAMS presented the history of a woman of fifty years who, while nursing a sister two years previously, had developed an obstinate spasmodic contraction of the orbicularis muscle. The reaction was believed to be psychogenic and improved greatly under reeducative and combined pharmaco and dietotherapy.

PARAPLEGIA

T. A. WILLIAMS presented the notes on an engineer thirty-seven years of age who had three years previously developed a paraplegia while organizing a union and suffering a back injury at that time. It cleared up in eight months after manipulative therapy. He was greatly relieved by a common sense reeducative treatment of persuasion within a comparatively short time.

UNUSUAL SENSORY DISSOCIATION

T. A. WILLIAMS presented the history of a student of twenty years who in December, 1918, suddenly became exhausted. In the following May he noted a dimness of vision in the right eye, closely followed by fainting attacks with rigidity and spasms, numbness and hypoesthesia in the feet with unsteady gait. A few months later further progression and paraplegic crippling. By February, 1920, a fairly complete multiple sclerosis syndrome was evident with what the reporter considered a rare syringomyelic dissociative syndrome also present.

ASSOCIATED UPWARD AND DOWNWARD OCULOMOTOR
PARESIS

W. B. CADWALLADER presented a boy of sixteen who in June, 1919, first complained of visual difficulties. In November, 1919, he had been hit by an automobile but apparently had not been severely injured. A month later bilateral temporal headaches developed with increasing difficulty in writing, with marked tremor. In February, 1920, neurological status showed enlarged right pupil, immobile to light, sluggish to other stimuli. Globes could not be raised above median plane but were slightly movable downward. Other ocular movements were free and ample. Superior rectus of each eye was paralyzed—the inferior rectus paretic. Small vessels and slightly swollen right disc. Ataxia of right upper extremity, with increased tendon reflexes, no paresis. Ataxia and clumsy movements of the right leg and right sided staggering were present. Tendon reflexes also exaggerated on this side. Diagnosis of mesencephalic tumor was made.

BILATERAL LENTICULAR DISEASE

GEORGE WILSON presented a boy ten years of age who showed delayed walking (five years) and who had just begun to talk. The gait was stiff and the speech was dysarthric, dysphagic and explosive and facial grimacing was present with other partly athetotic choreic like movements. There was slight hypertonicity of the extremities but no sensory changes or muscular weakness. The author proposed it as a lenticular syndrome.

C. B. BURR was disposed to regard the case as one of congenital cerebellar disease. W. G. SPILLER concurred in the assumption of lenticular disease.

Current Literature

I. VEGETATIVE NEUROLOGY

1. VEGETATIVE NERVOUS SYSTEM.

Crozier, W. J., and Arey, L. B. THE HELIOTROPISM OF ONCHIDIUM: A PROBLEM IN THE ANALYSIS OF ANIMAL CONDUCT. [Jour. Gen. Physiol., Vol. 2, p. 107-112; 1919.]

Onchidium floridanum is a West Indian shell-less snail living in small communities sheltered within holes and crevices of the shore between tidal limits. At the time of low water, the snails temporarily emerge and feed upon the algæ covering exposed shore-surfaces. This is done only during daylight hours, never at night. When tested apart from their normal environment, these creatures exhibit, nevertheless, a uniform and precise negative heliotropism. But their natural wanderings are executed without reference to the light. During the creeping of an *Onchidium* upon the rock immediately surrounding its home, heliotropism is completely inhibited; impulses originating in the substratum and mediated by special lappets on either side of the head, are more successful in competition for the control of the body musculature. The central inhibition of heliotropic impulses (which originate in the dorsal integument) can be obliterated ("reversed") by strychnine, and also by peripheral anesthesia of the oral lappets.

It is shown that the (latent) negative heliotropism of *Onchidium* is probably of no adaptive significance; on the contrary, it arises as an inevitable consequence of certain phenomena of irritability in the integument of the snail. [Author's abstract.]

Moore, A. R. THE ACTION OF STRYCHNINE AND NICOTINE ON THE NEUROMUSCULAR MECHANISM OF ASTERIAS. [Journal of General Physiology, 1919-20, ii, 201.]

Small specimens of the starfish *Asterias*, when strychninized by immersion in sea water containing strychnine sulfate 1:2500, show extreme dorsal flexure of all the rays. Individual rays which have been detached from the central disk give the characteristic reaction. When the ventral floor of the ray is separated from the dorsal sheath by cutting the two structures apart longitudinally, strychnine causes dorsal flexure of both parts. Therefore dorsal flexure of the normal ray is brought about by the action of the dorsoflex musculature of the floor as well as of the dorsal sheath of the ray.

Nicotine in sea water 1:50,000 causes extreme ventral flexure of the rays of a specimen of *Asterias* immersed in it. The same effect is shown by individual detached rays. When the ventral and dorsal parts of the ray are separated and put into the nicotine solution, the dorsal sheath bends dorsally just as in strychnine, while the floor flexes ventrally. Hence it must be concluded that ventral flexure of the intact ray depends solely upon the ventroflex musculature of the ray floor and that this is capable of more powerful action than are the muscles of the top sheath. Furthermore it follows from the results of strychninization and nicotization that the ventral floor of the ray contains muscle groups which act antagonistically. If we assume both of the alkaloids to act upon the nervous elements controlling this musculature, we may regard strychnine as an exciter of all such elements. Dorsal flexure then occurs because the sum of the musculature causing it is greater than that acting ventrally. Nicotine, while exciting the elements of the dorsal sheath, as regards the ray floor, acts specifically to excite the nervous elements controlling the ventral musculature. Nicotine can have no excitatory effect on the innervation of the dorsal antagonists of the ray floor, since this would of necessity result in dorsal flexure of the intact ray. These facts indicate a difference in the chemical constitution of the two sets of nervous elements concerned with the functioning of the antagonistic muscles of the ray floor. The preceding analysis is further borne out by the fact that a nicotinized *Asterias* when strychninized shows characteristic dorsal flexure, while an animal which has been first strychninized cannot be caused to flex ventrally by nicotine. [Author's abstract.]

Boissonas, L. PROGRESSIVE LIPODYSTROPHY. [Rev. Neur., Oct., 1919.]

In this summary from the literature and from a personal experience with two cases, the results of the findings in twenty-two cases are that the only plausible hypothesis to account for the phenomena is one in which the nervous system is involved.

Mut, A. VAGOTONIA. [Archivos d. Biolog. de Brazil., Aug.-Sept., 1919.]

The following account of vagotonia as revised by this observer and abstracted in the Medical Record is thus: A child with this makeup recalls the scrofulous individual of two generations ago, although the facies and the swollen glands of the neck are found in association with cold and cyanotic extremities and vasomotor instability; in other words, torpid and erethetic scrofula combined. There is a predisposition to eruptions of the scalp and in adolescence a tendency to acne. The subjects present a state of irritable weakness and are easily fatigued. Other somatic conditions mentioned are adenoids and enlarged tonsils,

myopia, and the sign of Graefe (lack of synergy between movements of the eyelids and those of the eyeballs), instability of the cardiac action as shown by palpitation, tachycardia, etc. There are, further, geographical tongue, granular pharyngitis, salivation, air-swallowing, irregular and capricious appetite, crises of constipation alternating with diarrhea, and membranous colitis. Among genito-urinary symptoms are phosphaturia, pollutions, and precocious ejaculation. Reflexes are exaggerated and tremor may be seen at times in various muscles, as the tongue and eyelids. The skin is disposed to flushing, cyanosis, and dermographism. Upon this substratum many phenomena known collectively as hysterical may develop. Of especial clinical interest are cardiac crises, such as paroxysmal tachycardia, gastric crises, and asthmatic paroxysms. Diagnosis is made by drug action, the subject reacting strongly to pilocarpine, while atropine should always favorably affect a true vagotonic. Drugs which produce sympathicotonus like adrenalin are also indicated. Curative treatment is limited largely to hydro- and physiotherapy. The reader will note the marked parallelism between vagotonia in childhood and Czerny's exudative diathesis.

Schafer. EXPERIMENTS ON THE CERVICAL VAGUS AND SYMPATHETIC. [Quart. Journ. Exp. Phys., Vol. XII, No. 3.]

The results of physiological experimentation by Schafer gave no evidence of functional regeneration of the peripheral vagus of the cat as long as two years and fifty days after section of the nerve. Death, which invariably occurs after double vagotomy, is due to laryngeal obstruction from paralysis of the laryngeal muscles, and that when this obstruction is avoided by extirpation of the cords, death does not occur. The slowing and depression of the respiratory movements, hitherto regarded as an accompaniment of double vagotomy, was found to be a by no means constant effect, and was not observed if the laryngeal paralysis were neutralized by a previous tracheotomy. No regeneration of the sympathetic nerves in the neck was found either in dog or cat. A curious phenomenon noted was that if eight days after section of one cervical sympathetic the other were divided, the symptoms of sympathetic paralysis on the side of the original lesion disappeared for some time and were replaced by all the signs of sympathetic irritation—dilated pupil, exophthalmos, etc.

Drago, A. OSSIFYING MYOSITIS. [Pediatria, Nov., 1919.]

This is a report of a typical case in a girl of eight years. She had shown a positive tuberculin reaction on cutaneous testing. There was typical bone depositions. He discusses the nature of the reaction and reviews the literature. He suggests that a localized alkalinosism might be responsible for this. Treatment in his case was without results. The course is fatally progressive, death generally occurring in conse-

quence of ossification of the vocal cords and esophagus or from tuberculosis secondary to ankylosis of the ribs. The disease may persist 10 to 15 years. The author has no inkling of a suggestion of vegetative nerve mechanisms.

del Valle, R. PROGRESSIVE MUSCULAR ATROPHY. [Riv. d. Med. y. Cir. Pract., Oct., 1919. J. A. M. A.]

Del Valle reports pronounced improvement in the case of progressive muscular atrophy in a man of 46 under electricity and hot sand baths twice a day. The best results were noted when the sand bath just preceded the faradization. The impotence of the hands from the muscular atrophy retrogressed under this mixed treatment in five months to such a degree that further treatment was not required. He was a working-man, and the first symptoms had been noted three years before. Repeated chilling of the hands was the only causal factor that could be discovered, and this suggested the advisability of the hot sand baths. The advantages of the sand bath are the unusually high temperature that can be used, the fact that perspiration can proceed unhindered, and that there is no maceration of the skin. No benefit was apparent from a course of strychnin, and it was abandoned.

Guillain, G., and Barré, J. A. PERIODIC PARALYSIS. [Ann. de Méd., Dec., 1919.]

A soldier, 36 years of age, had a paralysis of the arms which recurred about 2 p.m. with great regularity. It was not accompanied by pain but there was great weakness. No paresthesiæ. After 4-5 hours the weakness passes and the muscles were normal during the day, for occasional fatigue on writing. He had had this for sixteen years in mild forms, but the actual paralysis did not develop until he was in the trenches. The attacks vary in intensity. During the severer ones the normal electric reactions disappear. The cranial nerve innervations never showed paralysis. The tendon reflexes disappeared during the severer attacks, but the superficial reflexes showed no changes. No sensory disturbances. The blood Wassermann was positive on two occasions, but the spinal fluid shows no sign of neurosyphilis. The authors assume an intermittent toxic accumulation hypothesis.

Campbell, A. W. THOMSEN'S DISEASE. [Med. Jl. Australia, Dec. 13, 1919.]

A man, 27 years of age, for ten or eleven years had had a good muscular development to all appearances, but whose real power was slight. Every movement was hampered by the characteristic rigidity and tendency to tonic contraction, of Thomsen's disease and whose muscles were unduly firm in relaxation and show an alteration of electrical excitability, suggesting the myotonic reaction. The familial history was absent.

Bolten, A. ANGIONEUROTIC EDEMA. [Ned. Tidsk. f. Geneesk., Dec. 20, 1919.]

This patient, a woman of 40, with marked neurotic features, had acute attacks of headache with scotomata, and gastric disturbance. There then developed with this migraine an angio-neurotic edema in the neck, and colicky pains in the abdomen, with rapid subsidence. The colicky pains were attributed to an acute swelling of the mucous membrane in the neighborhood of the cecum. The removal of the appendix caused no improvement.

Chajes, B. MULTIPLE NEUROTIC CUTANEOUS GANGRENE. [Neurol. Centralbl., August 1, 1918, No. 15, Vol. 37.]

Neither the etiology nor the symptom complex of "multiple neurotic cutaneous gangrene" is as yet entirely clear, and in many respects this disease picture stands in need of explanation. The only certain positive sign of multiple neurotic cutaneous gangrene is the appearance on the skin, without any apparent cause, of numerous foci of varying size with gangrenous tendencies. The usual accompanying signs as blisters and vesicular formation and disturbances of sensibility are absent in some cases. In order to make a diagnosis, all other diseases presenting like cutaneous phenomena must be excluded and above all simulation or artefact conditions. Because the differentiation had not been carried out with sufficient care, there are numerous cases in the literature which cannot be regarded as certain examples of this disease. The best description has been given by Cassirer in his work on "vasomotor trophic neuroses." He reviews the entire literature of the world on multiple neurotic cutaneous gangrene and brings forward only twenty-five cases which have been adequately described. The author's case is that of a man thirty-nine years of age. He gave the impression of being hysterical. He had vesicular cutaneous eruptions on the breast and back and on the right lower thigh, with numerous ulcers and scabs. There was no history discoverable of a trauma which could have caused the affection and simulation and artefact conditions were excluded as far as it is possible to do so by human ingenuity. Kaposi describes a reliable sign for distinguishing neurotic from artefact gangrene—in the true disease the necrotic skin condition is visible shining through the blisters. This was the condition in the author's case. Cassirer calls attention to the fact that the results produced by the disease are so similar in the various cases that if there were imitation the same agent would have to be used in all cases, and under identical conditions, and this would be scarcely possible. In the author's case there was formation of blisters as in by far the greater part of the cases in the literature. Some writers have assumed the necrotic spots to originate in anemic or hyperemic patches but the microscopical examinations of Doutrelepon have shown that these spots were really blisters which do not come to development be-

cause the gangrene develops first. In the author's case these vesicles were of various sizes, from that of a pinhead to that of a bean. The necrosis and the scabs were dark brown or black in color and hard in consistency. They fell off in the course of a few days, leaving a well-granulated surface. The healing of the ulcers took from several days to four weeks according to their size. In the author's case there were never cheloids; the healing took place under protective dressings so that the patient could not interfere with the affected surfaces. Cassirer thinks that the formation of cheloids may be due to the lack of cleanliness or to the fact that nervous patients examine the wound frequently and in so doing irritate the granulating surface. Disturbances of sensibility preceded the appearance of the necrosis. Pain was felt before the blisters made their appearance. Other disturbances of sensibility such as is often described by various writers, pain in the vertebral column, blunting of feeling, etc., were not observed. There are certain similar diseases from which, in the author's case, the multiple neurotic cutaneous gangrene was carefully differentiated, as follows: from *ecthyma gangrenosum*, which makes its appearance almost exclusively in badly nourished individuals in the early years of life and runs a course different from that in the author's case; from multiple idiopathic bacterial gangrene due to infection, causing extensive and profound destruction of tissue which was not present in the author's case; from arterio-sclerotic gangrene which causes changes in the vessels not present in the case under consideration, and from diabetic gangrene, which can be distinguished by the presence of sugar. There was no evidence of organic disease of the nervous system. The author tried to produce artificial necrosis and blisters but without success. The histological examination of a section of the patient's skin with freshly formed vesicles gave the following results: in the depth of the ulcer was a large vessel which showed a pronounced endarteritis obliterans and further there was a necrotic formation and small cell infiltration. It was thought this change in the vessel may have been the main cause of the necrosis. No vacuoles were found in the section. The finding of endarteritis obliterans is remarkable and not in conformity with the histological findings of Doutrelepon, Dinkler, Kreibach, and others. The findings of Zieler and Truffi have more similarity with those in the author's case. It is possible that the phenomena observed by these writers represented the initial stages of the endarteritis obliterans found in the author's case. But there was not the slightest ground for assuming here a primary disease of the vessels. There was no change of the nerve fibers such as Dinkler describes. The bacterial examination of the content of the blisters gave no results of explanatory value and the author's case brings nothing new to the understanding of the pathogenesis of multiple neurotic cutaneous gangrene. There was nothing to show that the disease was in any way connected with the hysteria of the individual, besides every attempt to influ-

ence the condition of the patient by suggestion was without avail. What rôle the nervous system plays in the production of this disease is also obscure. Cassirer assumed that this is not a disease *sui nervis* but is a symptom complex which makes its appearance under various conditions. The author's case brought no evidence either for or against this view. The unconscious was not investigated.

Sieben, H. QUINCKE'S EDEMA. [Deutsch. med. Woch., Oct. 16, 1919.]

The author here reports the history of the occurrence of a chorea and angioneurotic edema in a girl of thirteen closely following an attack of influenza. He has observed a number of cases, in which not only chorea but also other nervous diseases were associated with influenza. As other after-effects of the influenza toxin he reports maniacal conditions, so severe as at times necessitating confinement. The author does not look behind the toxic process to the individual makeup.

Staffieri, D. ANGIONEUROTIC EDEMA. [Rev. Méd. del Rosario, (Arg.), Dec., 1919, J. A. M. A.]

Staffieri summarizes some of the prevailing views in regard to Quincke's edema, in the statement that it is characterized by abnormally exaggerated excitability of certain nerves which have control of the secretion and circulation of lymph. This hyperexcitability is almost always constitutional, the result of "dysendocrinia" (defective functioning of the endocrine glands), with thyroid insufficiency predominating he believes. This excitability is rendered manifest by influences of different kinds, including some which behave like antigens, inducing anaphylaxis. In the first of his two cases, one side of the throat was affected but there was no inflammation. The young man showed signs of thyroid insufficiency and hypogenitalism, and under thyroid treatment there has been no recurrence of the acute edema of the throat. Atropin and a saline purge relieved the immediate symptoms; it was the first and only attack to date. In the other case there had been fleeting edema at various points during seven years. In this latest attack the face alone was involved, and the edema was so extreme that the eyelids could not be closed. As usual, the edema subsided completely in a few days. The patient was a healthy married woman of 35 with two healthy children and negative Wassermann reaction, and there are no signs of derangement of any of the glands of internal secretion.

Neuda, P. DEATH FROM BURNS. [Wien. med. Woch., Nov. 1, 1919.]

Death from extensive skin burns is due, according to Neuda, to cardio-vascular paralysis, which is caused by the action of cholin and its ester, which are produced by the destruction of the tissues. The poisonous substance acts like muscarin and can be inhibited by atropine. He therefore treated five cases of very severe burns with atropine, with

the result that in two cases recovery took place and in the others life was prolonged, he believes. The marked vagotonia that results from extensive intense stimulation of the skin alone without poisoning is apparently overlooked.

Oppenheim, H. CONCERNING A CONGENITAL STATIONARY HEMIATROPIA FACIALIS. [Neurol. Centralbl., August 1, 1918, No. 15, 1918.]

A merchant 67 years of age came to the observation of the author, the left side of whose face showed distinct signs of an atrophic condition. On this side the face was deeply sunken in, three deep grooves, an upper and two lower ones having been formed. The musculature was thinner on the left, the skin was very thin and the subcutaneous tissue was entirely absent. The subcutaneous veins were extremely prominent, as well as the arteria temporalis. The feeling for stimuli of all sorts was normal on both sides of the face. The growth of hair on the left side of the skull was less abundant than on the right. There was myopia on the left. The patient showed signs of some mental defect from youth on. The affection is so characteristically developed that there can be no doubt of the diagnosis hemiatrophia facialis. While in the majority of cases this affection depends on an acquired and progressive disease, in the author's case it is congenital and stationary. The patient is a twin and he gave the explanation that some pressure in the uterus had produced the disease. The author was not able to ascertain whether exactly similar cases have been described in the literature, though his case seems to have resemblance to one described by Huber. Congenital forms of this disease have also been described by Gluck, Hennig, and Mauclaire. Usually with this congenital defect there are other defects of development on the same side of the body. Moebius, Marburg, and Cassirer have given comprehensive descriptions of this disease.

Boden, A. ERYTHROMELALGIA. [Rev. Méd. del Rosario, Dec., 1919, J. A. M. A.]

Boden describes what he says is the fourth case of this disorder to be published in Argentina. His patient is a bachelor of 34 with regular habits, healthy until the development of the erythromelalgia fourteen years ago. Four years later symptoms of Raynaud's disease became superposed on the Weir Mitchell set of symptoms, and the man wandered from hospital to hospital in search of a cure or at least some relief. The left big toe had to be amputated about two years ago, and the wound took seven months to heal. Boden cites the three other cases of erythromelalgia in Argentina, and mentions some still unpublished cases and one reported from Santiago de Chile in 1914. The redness and neuralgic pains are not necessarily restricted to the foot. In Cassirer's compilation of 67 cases both feet were affected in 24, both hands in 2,

both hands and feet in 17, one foot in 9, and one hand in 4. Auché has published a case in which there was congestion also in the eyes and testicles during the attacks. No acute or chronic infection or intoxication could be discovered to account for the disease in Boden's case, the patient being apparently free from acquired or inherited taint. The only pathologic finding was atony and ptosis of the colon, and great improvement was realized with treatment addressed to the intestines, repose and dieting. One case is on record in which Raynaud's disease subsided completely after resection of the entire colon, and this confirms the close connection between production of toxins in the sagging bowel and the vasomotor centers which regulate the circulation, especially the trophosecretory neurons and those regulating the peripheral circulation. If the intestinal disturbances do not yield to medical measures, colectomy should be considered. This would break up the sympathetic-medulla reflex arc and remove the source of the toxins, and it is now under consideration in this case. [In J. J. Ferro's 1919 inaugural thesis at the University of Lisbon, the recent international literature on erythromelalgia is exhaustively cited. The thesis is reproduced in the *Medicina Contemporanea* 37: 380, 1919.]

Bircher. ELECTRIC EXCITABILITY OF STOMACH WALLS. [Schw. Arch. f. Neur. u. Psych., 1919, Vol. 5, No. 1.]

Experimental and clinical experiences on seventy-five patients with various forms of electricity applied to the vagus innervation also directly to the stomach are here reported upon. The importance of the neurotic factor in ulcer is brought out. When the surgeon is unable to discover any somatic cause for the disturbances, electric tests may reveal pathologic conditions.

Spadolini, J. ACTION OF ADRENALIN ON THE MUSCULAR TONUS OF THE DIGESTIVE TRACT. [Arch. di Fisiol., 1918, Heft 3/4, p. 135.]

Adrenalin may action in an inhibitory or a kinetic manner, depending upon the strength of the adrenalin solution. Weak solutions injected into the blood vessels act in an inhibitory manner upon the motility of the intestines.

Spadolini, J. NERVOUS REGULATIONS OF INTESTINAL ACTIVITY. [Arch. di Fisiol., 1918, 3/4, p. 151.]

The peristalsis and rhythmical pendular movements of the small intestine are innervated by antagonistic nerve action of the cranial autonomic of the vagi. The thoracic-lumbar portion controls the position and form of the intestines through the splanchnics. Thus adrenalin changes the form of the organ, pituitrin influences the pendulum movements.

2. ENDOCRINOLOGY.

Robin, P. FACIOCRANIAL DYSMORPHOSES DUE TO DISTURBED ENDOCRINE FUNCTIONS IN CHILDREN. [Presse médicale, January 14, 1920.]

Poor functioning of the ductless glands is capable, according to the age period during which it develops, of inducing more or less pronounced aberrations of form and size of the bones of the face and cranium. These disturbances are associated with loss of balance of the patient's vegetative and psychic processes. He always presents a more or less sickly appearance. Additional endocrine disturbances may result from altered functioning of the thyroid gland and hypophysis, the latter being affected by direct *contre coup* from the faciocranial dysmorphoses to the induction of which they have themselves contributed. Apart from opotherapy, which manifestly cannot fail to be very useful, functional treatment of the facial abnormalities should be undertaken as soon as they are noticed, even if the child is but three years old. Faulty esthetics of the face are thus corrected, and the disturbance of the thyroid and hypophysis by *contre coup* directly antagonized.

Tixier, L. ENDOCRINES IN CHILDREN. [Bull. Méd., Nov. 8, 1919, J. A. M. A.]

Tixier analyzes in turn the clinical manifestations from insufficiency of the thyroid, suprarenals, pituitary and genital glands, and pluri-glandular insufficiency. He says that the minor signs of thyroid insufficiency are comparatively common between 10 and 15. They may include frontal headache or occipital neuralgia, severest in the morning, with lassitude after work and drowsiness after eating, and the children cry easily. The hands are pale or blue, the extremities cold. Thyroid treatment should be accompanied by restriction to a milk and vegetable diet, with a saline purgative once or twice a month. He gives the dry extract, 1 or 2 cg. daily, fractioned, to children under 5. Above this age he gives 5 cg. per day. Between 10 and 15, doses of 0.10 or 0.15 gm. are so high that special medical surveillance is necessary. The parents should take the pulse morning and evening, reclining and standing, and the rectal temperature. If the pulse goes up to 104 or 110 or the temperature goes above 38° C. (100.4° F.) the thyroid treatment should be stopped without waiting for minor and other symptoms. In the majority of cases, a few weeks of thyroid treatment abolish temporarily or permanently these minor signs of thyroid insufficiency. It may tone up the thyroid so that a tendency to myxedema may be thrown off. With actual myxedema, the thyroid treatment, he says, should be given twenty days each month throughout life. Treatment of pluri-glandular insufficiency does not require strictly specific organ extracts. On account of the synergy of the endocrine glands, one extract may prove effectual when others fail, even when the new organ extract does not seem to have anything to do with the symptoms observed, con-

tinuing the treatment possibly for months, and alternating or combining the organ extracts according to the results obtained. If there is any tendency to a positive Wassermann reaction, mercurial or arsenical treatment should supplement the organotherapy. In any event, organotherapy of any kind requires medical surveillance.

Clerc, A., and Pezzi, C. ANTAGONISM OF ADRENALIN AND QUININE. [Presse médicale, December 20, 1919.]

These authors report experimental work showing that in some respects adrenalin and quinine are antagonistic in their pharmacological effects. Complete antagonism exists as regards the medullary centers of the vagi, which adrenalin excites and quinine paralyzes, and as regards the heart, which adrenalin stimulates and accelerates, while quinine depresses and slows. Arterial pressure is raised by adrenalin and lowered by quinine. The adrenalin raises the pressure, however, by combined cardiac and vascular actions, while quinine lowers the pressure by depressing the heart more strongly than it contracts the vessels. Whereas adrenalin is a stimulant to the sympathetic nervous system, quinine may be considered to have a sedative action.

Richter, E. CHEMICAL BIOLOGY OF ADRENALS, HYPOPHYSIS AND THYROID. [Deut. m. Woch., 1919, No. 26, p. 709.]

By means of an adrenalin gold reaction test the author supposes that adrenalin is able to reduce metals from their salts. This capacity he has discovered to reside in the hormones which he has termed thyrealin and hypophysalin. Thus he argues for a dynamic opposing series of forces to the oxidizing functions of the lung. By means of a specific sympathetic nervous system stimulation these reduction energy releases increase the blood pressure and stimulate smooth muscle structures.

Faber, K. ADDISON SYNDROME. [Ugeskrift for Laeger, December 25, 1919.]

This observer narrates the history of a woman, 47, who was married but childless. Several months before admission to hospital her hands and fingers easily became cold and numb, and their color changed from great pallor to striking cyanosis. This would last for a quarter of an hour to two hours, and disappeared by warmth. Later the feet showed the same condition. It became steadily worse and was associated with increasingly severe pain. Small whitlows appeared on her fingers and herpes zoster broke out on her back, and abdomen. On admission to hospital in March, 1919, her nose was cyanosed and the tip of one finger was gangrenous. The breasts and linea alba were slightly pigmented. Wassermann's reaction and an x-ray examination of the pituitary body were negative. Later she began to vomit, the temperature became subfebrile, and she became asthenic. The pigmentation of the skin became

more widespread, and albumin appeared. The blood pressure was 155-120, the hemoglobin was 78 per cent., and the red cells numbered 3,500,000. The left suprarenal on autopsy was normal, but the right was slightly enlarged, and was the seat of caseous degeneration. Outside the definitely caseous parts there were scattered typical tubercles. The thyroid and the pituitary body were normal, and the thymus was represented only by a little fatty tissue. The author considers it remarkable that diseases of only one suprarenal was sufficient to cause Addison's disease.

Goetsch, E. ADRENALIN TESTS. [Med. Soc. New Jersey, N. Y. Med. Jl., Jan. 3, 1920.]

Goetsch stated that it was his purpose to report the results of a clinical study of approximately 300 cases of thyroid disease in the human subject with especial reference to the sensitiveness of these patients to the hypodermic administration of adrenalin; to show that in clinical states of hyperthyroidism there was an increased constitutional sensitiveness to adrenalin and in states of hypothyroidism there was an increased tolerance for adrenalin hypodermically administered; and to indicate the practical application of this knowledge to the study, diagnosis, and treatment of thyroid disease in the human subject. With the abundant physiological evidence that increased thyroid secretion caused a hypersensitiveness of the sympathetic nervous system to the action of adrenalin, he thought it would be of interest to test the reaction of human patients suffering from hyperthyroidism to the subcutaneous administration of adrenalin. His thought was that if thyroid secretion sensitized the sympathetic endings to the action of adrenalin, it was reasonable to suppose that a sudden increase of adrenalin in the circulating blood should call forth active responses throughout the domain of distribution of the sympathetic nervous system. This result he had found to be remarkably constant. The work was begun five years ago while he was in the surgical clinic of Professor Cushing and continued during the past four years in the clinic of Professor Halsted at Johns Hopkins Hospital. To his great surprise and satisfaction the first patient exhibiting hyperthyroidism, a case of exophthalmic goiter, gave a sharp reaction to the injection of adrenalin, and since that time he had personally carried out or supervised the carrying out of the test in 300 cases of thyroid disease and in approximately 100 cases simulating in many respects hyperthyroidism. In a so-called positive reaction there was usually an early rise systolic and a fall in diastolic blood pressures. In a very mild reaction the fall in diastolic pressure might occur alone. There was a rise in pulse pressure of at least ten and sometimes as much as fifty or more millimeters of mercury. In the course of thirty to thirty-five minutes there was a moderate fall of the pulse and blood pressure, then a characteristic secondary rise, followed by a second fall

to the normal in about an hour and a half. Together with these changes one saw an exaggeration of the clinical picture of Graves's disease or hyperthyroidism brought out, especially the nervous manifestations.

Sparrow, Gordon. A CASE OF COEXISTENT SUPRARENAL AND RENAL DISEASE OF UNCERTAIN ORIGIN. [Brit. Med. J], Oct. 11, 1919.]

It is now definitely established that the integrity of the suprarenal bodies is essential to life by virtue of an important internal secretion. Whatever be its true nature, adrenalin would appear to be, in the light of our present knowledge, the chief active principle, in that it possesses marked tonic influence on all muscle, especially the non-striped variety, and thereby exerts marked influence on the blood-pressure. While the medulla is believed to be the sole seat of its manufacture, it has been argued that the cortex is concerned with the elimination of toxins from the blood-stream, and, although this theory lacks confirmation, it is not improbable, seeing that the two portions of the gland are developmentally distinct, and therefore likely to have totally different functions. Pathological changes in the glands in question are common in cases dying of both acute and chronic affections¹ and there seems little doubt that asthenia with low blood-pressure, so commonly associated with early convalescence, is dependent on suprarenal insufficiency (symptoms may be typically Addisonian)² and is much benefitted by administration of extract of the gland. The commonest lesion post mortem in acute cases is found to be congestion and hemorrhage, originating in the deepest part of the cortex, together with cloudy swelling, necrosis, etc., of cells, in chronic cases these changes are not so severe but fibrosis is evident.

Marcelli¹ found fatty infiltration of the cortex present in acute infections, marasmic and cachectic states and in pulmonary and cardiovascular disease. Fordyce¹ in a large number of post mortems reported fat, occasionally in large amount, especially in chronic cases, in the cortical cells and medullary stroma, but never in the medullary cells. Mott and Halliburton³ concluded that suprarenal changes of similar nature present post mortem in a series of mental diseases examined by them were solely dependent on the intercurrent diseases from which these patients had died. From his observations, Fedreci² considers that the suprarenals have no special tendency to take up organisms but that such post mortem changes are due to the action of toxins. The following case showed unusual post mortem changes, for, whereas the cortex was but slightly affected, the medulla appeared to have undergone complete fatty degeneration and liquefaction. The clinical picture was very interesting because, in addition to severe Addisonian symptoms, signs of renal disease were present, which at the autopsy were confirmed by grave changes in both kidneys. Unfortunately under active service

¹ Fordyce, Scot. Med. Journ., 1905, Vol. 17, p. 223.

² Hurst, Bury, and Wilkinson, Seale Hayne Studies, Vol. 1, No. 5, p. 272.

³ Pro. Physiol. Socy., Journ. of Physiol., Vol. 34, 1906.

conditions. I had not the facilities for intimate study of the renal disease that the case merited. The patient, aged 32, had always enjoyed good health until two months prior to admission to hospital, when he became aware of increasing weakness and nocturnal dimness of vision, accompanied by periodical vomiting. No childish illness of note.

On admission (October 27, 1918), the temperature was 102° F., there were no physical signs other than lethargy, low blood-pressure and slight anemia. The course was thereafter subnormal except from November 4 to 7, when the temperature was raised, and two intramuscular quinine injections were given in spite of negative blood-films, malaria being rife in Palestine at the time. The bowels tended to be constipated until the termination, the urine averaged 40-50 oz. daily, and showed a heavy cloud of albumen but no casts or organisms.

Progressive asthenia and periodic vomiting, unrelated to food, were the only symptoms, a large *Ascaris* worm being ejected on one occasion. The blood-pressure gradually fell, the last sphygmomanometric reading being 62 mm. (systolic), on November 23, no increase being evidenced by pituitarin injections. A purpuric eruption appeared on November 9 and for some time the breath smelt strongly of acetone, at no time was there any sign of edema. For ten days before death the abdominal and tendon reflexes were absent, the cilio-spinal also, and the sympathetic light reflex barely elicited, an appreciable degree of bilateral pseudoptosis was present, and capillary instability marked.

Typical Addisonian pigmentation appeared about this time, the purpura being still evident. A blood-count was as follows: Total whites 11,600 (polymorphs 84 per cent., lymphocytes 10 per cent., large mononuclears 4 per cent., eosinophils 1 per cent., myelocytes 1 per cent.), slight poikilocytosis and anisocytosis of reds, no basophil staining or polychromatophilia. No nucleated reds. Diarrhea with much bright blood ended the scene on December 3, the patient being quite conscious till the end. The course in hospital was just over five weeks.

Post Mortem.—The cortex of both suprarenals was atrophied somewhat, the cells showing cloudy swelling and granularity, no hemorrhages. To the naked eye the medulla in each case was represented merely by a deeply pigmented, thin-walled sac, containing some fatty material. Microscopically all true medullary tissue had disappeared, being replaced by fatty spaces. The right kidney showed extreme degree of small white kidney, being no larger than a hen's egg. The left showed the contracting stage with much subacute tubular change, confirmed by microscope.

The lumbar glands were generally enlarged, no caseation.

Both large and small intestines showed numerous purpuric patches, especially the former, but no ulceration or worms.

The heart was not enlarged, the muscle was cloudy, the aorta normal. With the exception of cloudy swelling of liver, the remaining organs appeared normal. C.S.F. normal.

N.B. The post mortem was performed eight hours after death, which took place at 1 a.m.; the weather was cold at the time.

Conclusions.—Whether the combined suprarenal and renal condition occurred primarily or secondarily to an obscure toxemia it is difficult to say, the very occasional pyrexia is puzzling. Clinically the suprarenal picture greatly overshadowed the renal and the absence of edema and cardiac hypertrophy, so common in chronic renal affections, is explained probably by the low blood-pressure determined by the adrenalin deficiency. The disappearance of the deep reflexes recorded was also due no doubt to the same cause occasioning severe myotonia.. [Author's abstract.]

Schlesinger, H. ACTION OF ADRENALIN IN OLD AGE. [Wien. med. Woch., November 22, 1919.]

The author states that when adrenalin is given subcutaneously to elderly people such a procedure may provoke attacks of stenocardia, probably due to the atypical reaction of atheromatous coronary vessels. Another atypical reaction is a fall of blood pressure. Though in healthy youth the drug raises the blood pressure for several hours, in about one-third of the elderly persons tested the injection induced a fall of blood pressure, either immediately or after ten minutes. This fall lasted up to two and a half hours, with a gradual return to the normal. There was no sign of collapse and no increase in the pulse rate; indeed, the rate of the pulse was apt to fall without any unpleasant sensations. Evidence of collapse being absent this reaction of elderly persons to adrenalin could not be regarded as the expression of cardiac insufficiency. Schlesinger's interpretation depends on the assumption that adrenalin stimulates both the vaso-constrictors and, to a less degree, the vaso-dilators. This vaso-dilator action is demonstrable in experiments on animals when the vaso-constrictor mechanism is put out of action. The small doses of adrenalin given to elderly persons probably acted principally on the vaso-dilator system, as shown by the sensation of burning and warmth felt in the hands and feet. The lack of calcium in the system, as well as atheromatous changes, probably contributed to this atypical reaction in old age to adrenalin.

Strauss, Spencer. THYMUS GLAND MALIGNANT NEOPLASMS. [N. Y. Med. J., Oct. 18, 1919, p. 696.]

To understand clearly the nature of thymus gland neoplasms it is important to bear in mind their histogenesis. The gland is entodermal in origin. It results from a paired outgrowth of the entodermal epithelium of the third branchial clefts. These outgrowths finally become separated from their point of origin and continue their growth independently. At all times does the gland maintain its bilobar character. After birth the gland continues growth to a maximum at puberty and

then recedes, but thymic parenchyma may be demonstrated into senescence. The origin of the apparently lymphoid cells is interesting and as yet unsolved. Probably the organ is composed of two types of epithelial cells, the supporting reticular epithelium and the Hassal bodies, which are merely hypertrophied reticular cells later undergoing necrosis and calcification. Granting that the organ is purely epithelial, one must carefully classify neoplasms arising therein along purely morphological lines not genetic. It is impossible to attach to tumors a true histogenetic significance once we recognize that neoplasms of identical type may originate from any of the germ layers. Cases of malignant thymic neoplasms are rare, particularly the carcinomata, of which I have found but four in the literature. In order to diagnose positively a growth as thymic one must consider the following points:

1. The position of the growth in the place usually occupied by the thymus is no reason for saying that the growth is absolutely thymic in origin for with larger neoplasms where other structures are involved the point of origin is impossible to determine.

2. The form of the growth is not useful as a diagnostic point, for all malignant growths are irregular in their paths of extension.

3. The demonstration of thymus remnants in the growth is no proof, for often the neoplasm starts outside of, but finally includes, the thymic rest.

4. The morphology of the cell elements of the growth is the one criterion upon which a diagnosis can be made; and here it is important to say, that although the presence of the Hassal corpuscles in the mass determines absolutely its thymic origin, their absence does not prove anything, for they are at best not easily found; they occur chiefly at the periphery of the gland and are best demonstrated in fresh specimens and as the gland matures these bodies grow less and less numerous.

In my case the autopsy findings were as follows: The contents of the entire mediastinum were removed. Over the base of the heart, exactly in the position normally occupied by the thymus, was an irregularly shaped mass which measured about 5 cm. square. The heart was slightly enlarged and the musculature was uniformly hypertrophied. On opening the right auricle it was found that the lumen of the superior vena cava had been entirely obliterated from without. It was further found that the growth had extended into the musculature of the interauricular septum. No other mediastinal structures were disturbed. A normal thyroid was found in its proper place. The pathologist's diagnosis was definitely that of a squamous cell carcinoma. No Hassal corpuscles were demonstrated. A search for metastases was not permitted. The collateral circulatory route was probably from the subclavian veins into the cutaneous vessels; from there to the superior epigastrics, and back through the iliacs and the inferior vena cava.

Conclusions.—(1) That the thymus is entirely entodermal epithelial structure.

(2) That remnants surely persist to the age of forty, probably longer.

(3) That malignant neoplasms arising from the gland may be divided into sarcomata and carcinomata, but only, if one adheres to the morphological classification.

(4) That the diagnosis of thymic origin may be made in spite of the absence of the Hassal corpuscles in the growth.

(5) That in the presence of mediastinal new growths, the possibility of thymic origin must be considered even up to an old age.

(6) Sarcoma is more frequent than carcinoma in the young; carcinoma more frequent in the old. [Author's abstract.]

Naegeli. ANTAGONISM OF CHLORIS AND OSTEOMALACIA AS HYPO AND HYPERGENITALISM. [Münch. med. Woch., 1918, 23.]

Chlorosis and osteomalacia are here considered as mirror pictures of each other. In chlorosis there is a hypofunction of the gonads, the conception capacity is diminished, the menstruation scanty or absent, the secondary sex characters slightly developed. The skin pigmentation is scanty, the thyroid activities normal, the skeletal system strong, the musculature well developed, the fatty deposit increased, the mineral metabolism active. The psyche is characterized by apathy, there is little or no tremor, the reflexes normal, the perspiration scanty. The bone medulla show hypofunction, the blood serum hydremic, the blood platelets increased. The anemia is primary. On the other hand in osteomalacia the gonadal activities are increased, the conception capacity increased, the menstruations marked, the interstitial ovum cells hyperplastic. With pregnancy chloasma are marked, the thyroids underfunction, the bony structures delicate, musculature weak, fatty and mineral metabolism strongly underactive. Mentally the individuals are excitable and psychotic manifestations marked. Tremor is frequent and the reflexes exaggerated. The bone marrow shows hyperactivity with secondary exhaustion. The serum is concentrated, the globulin content increased, the blood corpuscles diminished, secondary anemia. The clinical pictures rarely are as clear cut because of the interplay of other glandular complications and because different stages of the progress of the syndromes are under observation.

Schwartz. MASCULINE PSEUDOHERMAPHRODISM WITH NORMAL VAGINA. [Bull. Med., Dec. 6, 1919.]

A normal vulva is frequently present in male pseudohermaphrodites but it is not often that the vagina is developed, for the absence of a uterus usually involves more or less deformity of the vagina, varying from a total absence to a short rudimentary canal without the structure of the normal organ. Hence these pseudo-females are not often able to have sexual relations with men. In the present case the subject

was ostensibly a woman aged 25 who presented herself for painful bilateral inguinal tumors. On one side the tumor proved to be a hernia but in the opposite side was found a testicle with epididymis and vas deferens. Operation on the first side showed that a testicle was also present in the hernial sac. The vulva was perfectly formed and the vagina was ample in width and about 12 cm. deep, ending in a cervix uteri. There was a uterus but apparently it had no cavity and an imperforate os. Menstruation had never been established. The *embonpoint*, hair of the head, and pilous system in general, and the breasts were those of a woman, but the voice was masculine and the feet large. The individual was attracted to males, had been married two years and had natural and pleasurable sexual relations with the male partner.

Mendoza, M. R. DISTURBANCES AFTER OVARECTOMY. [Rev. de Psychiatria, Lima, Oct., 1919.]

In the present summary of nine case histories the author shows that artificial menopause induced severe nervous disturbances which were accompanied by definite changes in character. Organotherapy was of no service. In the severer cases conversion and compensation symptoms were manifest. One patient of 40 had attacks of unconsciousness with some benefit under ergot. Headache, insomnia, neuralgias and pain in the lumbar region were among the more banal symptoms.

Weber, P., Gunewardene, T. H., and Turnbull, H. M. SEQUEL OF LIPODYSTROPHIA PROGRESSIVA. [Br. Jl. of Children's Dis., Oct.-Dec., 1919, J. A. M. A.]

It is claimed by the authors that this seems to be the first published postmortem examination of a case of lipodystrophia progressiva. The patient, a girl, aged 13 years, was operated on for a purulent otorrhea. Soon afterward there developed a septic type of pyrexia. The patient died about three months after operation. In the sections of the scalp and abdominal wall, the only evidence detected of fatty tissue was the presence in the scalp of a few small areas which may have been occupied by fat cells. One of the sections of the suprarenal bodies included a little of the surrounding retroperitoneal tissue. Definite fatty tissue was present in this. In no section were there lobules of embryonic fatty tissue such as are found in the fetus, and in infants during the first and even second year of life. No abnormality was detected in the ovary. In the suprarenal bodies there appears to be less lipid than usual in the cortex. In the thyroid glands there was an excess of secretion of colloid. The authors consider it reasonable that such a pathologic condition of the thyroid was connected with the abnormality in the subcutaneous fat.

Porot, A. ACHONDROPLASIA IN GREEK ART. [Rev. Neur., Nov., 1919, J. A. M. A.]

Porot relates that after the siege of Athens by the Romans, 86 B. C., some of the ships taking the loot from Athens to Rome were wrecked, and one of these wrecked ships was discovered a few years ago in the sand bars off Tunis. Its cargo of Greek statues, etc., is now installed in the museum at Bardo. Among them are some bronze statuettes of dwarfs which show all the attributes of the achondroplastic type described by Marie. The trunk, the head and the sexual organs in this type develop normally, but the long bones are stunted, and these features are faithfully reproduced in these dancing figures of which illustrations are given.

Loeb, L. INTERNAL SECRETIONS AS A FACTOR IN THE ORIGIN OF TUMORS. [Jl. Med. Research, 40, 1919, 477.]

Studies on the heredity of cancer in mice which were continued for more than ten years made it possible for us to separate many strains and families of mice, the cancer incidence of which we are able to follow through successive generations. We found the cancer rate to be characteristic for each strain and family and the great differences which existed between different strains in this respect were maintained through years of observation. Starting with such strains of known cancer incidence we studied the effects of internal secretion on the origin of cancer. Cancer in mice is almost exclusively cancer of the breast in females. We selected therefore the ovary as the probable seat of an internal secretion which might influence the origin of cancer of the breast. We castrated a series of mice at various ages, some at the age of three to five months (these are young, but sexually mature mice); others at the age of five to seven months, and still others at the age of eight to ten and a half months. Then we kept these mice under observation, until they died and compared the cancer rate of these different series with those of normal mice of corresponding strains.

Our main conclusions are as follows: A hormone given off by the ovary regulates those tissue changes which lead to the development of cancer of the breast in mice. The influence of this hormone is a quantitatively graded one. If the quantity of this hormone which had a chance to act on the tissues exceeds a certain limit, cancer appears as frequently as in non-castrated controls. If an intermediate quantity of the hormone has been active, the cancer rate is noticeably diminished and the cancer seems to appear later in life; if the quantity of the hormone is restricted still further, cancer does not appear at all or it appears only exceptionally. Certain observations which we made in these experiments suggest the conclusion that the tissue changes which eventuate in the development of cancer, occur at a much earlier period in life, and that castration affects these primary tissue changes rather

than the secondary transformation of these changes into fully developed carcinomatous growths.

Prevention of breeding in mice without castration lowers the tumor rate and raises the tumor age only slightly; its effect is not comparable to that of an early castration. Castrated, as well as non-breeding mice which are not cancerous, reach a higher age than normal, female, non-cancerous mice. The chance to develop cancer is therefore better in castrated and non-breeding mice than in control mice on account of the greater number of mice reaching a higher age. If in castrated and non-breeding mice the age were the same as in controls, the reduction in the tumor incidence would even be more marked than it is actually found. Transplantation of the ovaries of the sisters into young castrated male mice belonging to strains with a high tumor rate has so far not led to the development of tumors in the male mice. The relationship between the origin of cancer and internal secretion is not only a quantitative, but also a specific one; a hormone influences the development of cancer only in those organs, to which under normal conditions it has a specific relation. We may assume that connections similar to that between cancer of the breast and ovary exist also between the cancers of certain other organs and internal secretions which exert a growth-regulating influence on those organs. While we could show that in certain cases at least internal secretion does exert an influence on the growth of adenomata, it follows from our experiments that it is without noticeable effect on the growth of carcinomata after they have been established. On the other hand prevention of the effect of internal secretion can under certain conditions prevent the development of cancer.

In the main three factors are active in the development of cancer: (*a*) heredity, (*b*) physical stimulation (irritation), (*c*) chemical stimulation (internal secretion). Internal secretion seems to cause cancer only in coöperation with hereditary factors. On the other hand hereditary factors need—at least in the case of certain cancers—the coöperation of hormones in a definite quantity, if cancer shall develop. Physical stimulation is also under certain conditions associated with hereditary factors in the origin of cancer. On the other hand, the evidence points to the conclusion that if the physical stimulation is sufficiently strong, cancer may develop without the coöperation of these hereditary factors. [Author's abstract.]

Moro, E. SPRING PEAK IN TETANY. [Münc. med. Wochenschr., Nov. 7, 1919.]

The author here presents a statistical inquiry into the prevalence of tetany. His curves tend to confirm the belief in a seasonal prevalence of tetany. There is a gradual increase during the fall and winter months, to its apex about March, when the number of cases decline

rapidly, and then drops off more gradually until midsummer. In those adults who have had tetany attacks as spring approaches, the skin of the hands often feels dead or leathery. The markedly increased irritability of the vegetative nerve system, and with the increased activity of internal secretions that regularly occur in spring, are thought to account for these changes. He calls attention to the special vagotonic influences that cluster about the spring time.

MacCallum, W. G. GASTRIC TETANY.

The occurrence of gastric tetany following the obstruction of the pylorus suggests the existence of some chemical alteration in the circulating fluids. When this condition is artificially imitated by obstructing the pylorus and keeping the stomach washed out it is found that symptoms somewhat resembling those of gastric tetany appear. They consist in convulsions and electrical hypersensitiveness of the nerves and lead to death with emaciation. When the blood plasma is studied it is found that there is a great decrease in its contents of chlorine and this is easily understood because the contents of the stomach, which are constantly removed, are rich in chlorine. The consequences of the reduction of chlorine are an increase in alkali reserve of the plasma and a corresponding increase in the electrical excitability of the nerves which appears to be the basis of the spontaneous twitchings and convulsions. All of these can be prevented by furnishing constantly a large supply of chlorides and the injection of chlorides goes far to ameliorate the conditions when it is already established. The convulsive movements are not exactly like the twitchings of the tetany of parathyroidectomy in which we have found no heightened alkali reserve, but they can be produced by the injection of sodium carbonate or bicarbonate. [Author's abstract.]

Barach, and Murray, Jr. TETANY. [J. A. M. A., March 20, 1920.]

Tetany as a complication of sprue seems to have been first reported a few months ago by Bassett-Smith. These authors report a case which they observed in a returned American missionary in the Presbyterian Hospital, New York, as being of interest. The lack of calcium in the blood, which has been shown to produce tetany, was demonstrated by analysis. Sprue patients cannot readily digest fats, and the authors ask if it is not conceivable that the calcium was carried on with the fat and insufficient absorbed through the diseased intestinal mucosa. This is mentioned as a possible predisposing factor. They suggest that as calcium is mainly excreted in the large bowel, in the present case, owing to the prolonged irritation lasting over six years, the excretion may have been abnormally increased and may have disturbed the calcium equilibrium. In this case it seems farfetched to attribute the appendicitis and general peritonitis, found at necropsy, as being caused by tetany.

Other points are suggested, but not conclusive enough to explain all features of the case.

TETANY. [Editorial J. A. M. A., 1920.]

The increased irritability of the nervous system associated with muscular tremors and occasionally convulsive seizures, a group of symptoms designated as tetany, not long ago appeared likely to find a scientific explanation in the study of the functions of the parathyroid glands. Excision of all of the latter leads to the characteristic nervous manifestations of tetany. These are also noted in man in association with gastric disease, particularly in patients who have long suffered from obstruction at the pyloric orifice. The attempt to relate gastric tetany to parathyroid insufficiency has encountered obstacles; for the parathyroid structures usually have been found to appear intact in these cases, and the condition is often relieved by gastro-enterostomy. It will therefore be understood why medication with parathyroid substance has been of questionable advantage in the treatment of gastric tetany. The results have been disappointing thus far, if they may not actually be described as failures.

Even if the cases of tetany, as they are seen during pregnancy and after parturition, in infants, in gastric disease, in certain occupations, and in parathyroid insufficiency have no apparent immediate etiologic relationship, it is not impossible that in ultimate analysis the increased nervous irritability may have a common metabolic cause. Wilson¹ and his co-workers at the Johns Hopkins Medical School found that, following parathyroidectomy in dogs, the equilibrium between acids and bases is displaced in favor of the bases, and that in tetany which develops after such a procedure there is well marked alkalosis. The results have been confirmed by McCann² at the Harvard Medical School, who agrees that there is a marked increase in the carbon dioxid-combining power of the blood plasma, coincident with the development of tetany.

McCann has extended the study to the phenomena of gastric tetany. He found that after operations on the stomach which exclude the acid secreted from the duodenum, tetany develops, accompanied by an increase in the carbon dioxid-combining power of the plasma similar to that of parathyroid tetany. These facts have led McCann, like some of his predecessors, to the conclusion that tetany is a condition of alkalosis in which a disproportion between rates of secretion of acids and alkalis by the gastro-intestinal tract may be a factor.

A disproportion of acids and bases leading to accumulation of the latter—an alkalosis—might conceivably be due to a heaping up of alkali

¹ Wilson, D. W.: Stearns, Thornton, and Janney, J. H., Jr. *J. Biol. Chem.* 21: 169, 1915; Wilson, D. W.; Stearns, Thornton, and Thurlow, M.D.: *ibid.* 23: 89, 1915.

² McCann, W. S. A Study of the Carbon Dioxide-Combining Power of the Blood Plasma in Experimental Tetany, *J. Biol. Chem.* 35: 533 (Sept.), 1918.

in the organism or to a withdrawal of acid such as the gastric juice represents. Tetanic symptoms can, indeed, be induced by excessive injections of sodium carbonate or bicarbonate. MacCallum and his collaborators have presented a somewhat different feature for consideration. They noted that when the pylorus is obstructed and the gastric juice with its hydrochloric acid is constantly removed, there ensues a decrease in the chlorin of the blood plasma and a consequent increase in the alkali reserve which becomes extreme. The electrical excitability of the nerves is heightened, and spontaneous twitchings arise. These are symptoms of gastric tetany. According to MacCallum, all this can be prevented by constantly furnishing a large supply of chlorids. He states that it is less easy to cure the condition by the administration of chlorids. It is easy to understand that sodium chlorid, which is reported to be efficacious in this experimental gastric tetany, might serve as a source of hydrochloric acid. But what becomes of the sodium ion? And why are chlorids more efficacious, as we are told, than acids? Here are seemingly conflicting factors which need to be reconciled or explained before a rational treatment of gastric tetany can finally be instituted.

Koopman, J. HYPOPHYSEAL DIABETES. [Endocrinology, 1919, 3, 485.]

The author observed two cases of diabetes with a glycosuria apparently independent from the diet. In both cases tolerance for carbohydrates was high, if no proteins or very small quantities of these were given. Bigger quantities of protein with even very small quantities of carbohydrates caused glycosuria. Both cases were favorably influenced by administration of hypophysis tabloids. [Author's abstract.]

III. SYMBOLIC NEUROLOGY

NEUROSES AND PSYCHONEUROSES.

Rosanoff, A. J. A STUDY OF HYSTERIA BASED MAINLY ON CLINICAL MATERIAL OBSERVED IN THE U. S. ARMY HOSPITAL FOR WAR NEUROSIS AT PLATTSBURG BARRACKS, N. Y. [Am. Arch. of Neurology and Psychiatry, Oct., 1919.]

The World War created an unprecedented opportunity of observing psychoneuroses in large numbers of cases and under conditions which forced into view their underlying psychic mechanisms. A study of the Plattsburg material points to neuropathic heredity as the essential factor in etiology. The family and personal histories of the patients reveal a relationship of some sort between hysteria and other neuropathic manifestations, particularly various constitutional psychoses, mental deficiency, epilepsy, psychopathic states, etc. The hysterical tendency, as observed in individual cases, varies widely in degree, and shades off toward normal constitution, *i.e.*, comparative freedom from such tendency, by gradual transition.

The constitutional basis of hysteria being granted, the question still remains, What are the immediate factors at work in the etiological mechanism, or, more specifically, in what way are disabling manifestations produced and maintained? The patients themselves, especially the more weak-minded and ignorant among them, are apt to attribute their disabilities to trivial and inadequate causes: astasia-abasia attributed to a two-mile hike, aphonia of several months' duration to a cold, hemiplegia with hemianesthesia to inoculation against typhoid.

In the early months of the war medical writers mentioned physical and psychic factors more or less indiscriminately. Gradually, as the distinction became clear between true cerebral concussion and psychoneuroses, the view gained ground that physical factors, as such, played no part in the etiology of psychoneuroses.

The bulk of psychoneurotic conditions observed at the front are cases of acute emotional syndrome and not hysteria. According to Léri it is a mistake to think that hysterical manifestations are an integral and necessary part of the emotional syndrome; they can appear independently of all emotion; and the emotional syndrome has nothing in common with hysteria. It seems that the psychic factors to which in general war neuroses have been attributed—fright caused by danger from projectiles, horrifying sights, etc.—play a part only in the acute emotional syndrome; hysterical phenomena are not directly produced by them, but arise, after the lapse of a greater or lesser interval of time, by a different psychic mechanism.

The factor which, according to the author, is the mainspring of hysterical conduct consists in a *concealed, illicit, morally untenable motive*, such as to evade the law of conscription; to procure rejection for physical unfitness; to evade dangerous, disagreeable, or difficult duty, or to evade all duty; to procure the ease and privileges of hospital care; to procure discharge on certificate of disability; to procure compensation for disability. That this factor, and it alone, and not shell concussion, war strain, emotional shock, etc., actuates hysterical conduct, is further shown (1) by the development of cases in the domestic cantonments during the first few days of training, *i.e.*, before any "war strain" could possibly have made itself felt; (2) among prisoners of war, who had been, like other soldiers, exposed to shell fire, strain, etc., scarcely any cases of hysteria have been observed; (3) in a great many cases, recovered and discharged from hospitals, the trouble recurred without any cause other than the prospect of being returned to duty at the front.

The above viewpoint is borne out not only by the conditions under which disabling symptoms arise, but also by the conditions under which they disappear. The particular method of therapy employed seems to be a matter of comparatively little importance. The mechanism of cure readily reveals itself when studied in the light of the above dis-

cussed mechanism of etiology. One or more of the following factors are frequently seen to be operative in cures: an attitude on the part of medical officers impressing patients in such a way as to preclude any hope of successful imposition; demonstration of the unreal nature of the disability; strict discipline as opposed to sympathy, coddling, or humoring; painful or otherwise disagreeable features of treatment; removal of motive, actuating the symptoms, by change in situation (return to U. S., signing of the armistice, etc.).

This raises the question of the relationship between hysteria and malingering. The motives actuating malingering are the same as those here postulated as being the mainspring of hysterical conduct, and writers are agreed that the manifestations of hysteria and malingering are the same. The main point to which the differentiation is fastened almost unanimously is *the conscious or unconscious quality of the motivation*. Other points of differentiation have been suggested, as follows: if persuasion fails to cure the case is not hysteria but malingering (Babinski); a desire to be cured speaks for hysteria, the opposite indicates malingering; the malingerer dreads examination, the hysteric welcomes it; hysterical manifestations bear the stamp of a certain genuineness which those of malingering lack. The military experience seems to have shown that these points of differentiation are not to be relied on. The author concludes that "*What some have described under the name of hysteria and what others have described under the name of malingering are one and the same thing*". The difference seems to be entirely one of viewpoint; 'hysteria' is an expression which would stress a medical viewpoint; 'malingering' is one which would stress a legal viewpoint."

To the author the essential feature of the hysterical personality, as observed in the Plattsburg cases, seems to consist in a *character defect*: "A desire to lead a parasitic existence, to be a burden on relatives, employers, the government, to live on a pension and do no work, is characteristic of many of these patients. He was unable, in the great majority of cases, to detect any pricking of conscience, evidence of regret at being a burden rather than help to their country in its great emergency, and struggle between nobler and baser parts of self, but rather a general lack of evidence of the existence of a nobler self in these cases."

The author's general conclusion may be stated in his own words: "I feel, on the one hand, that the practice of camouflaging the true nature of the conditions here dealt with by means of such euphemisms as hysteria, war neurosis, concussion neurosis, traumatic neurosis, shell shock, etc., and thus, through implied authoritative professional support, imparting to them a stamp of respectability, is bad in every way. On the other hand, in view of the fact that, whether conscious or unconscious, simulation of disease occurs on a basis of inborn neuropathic

constitution, it cannot be encompassed within the simple formula of malingering, *i.e.*, crime, the responsibility for which is entirely upon the patient. He would banish from medical classification the above named terms and others like them and designate the cases in question *Constitutional Psychopathic State, Simulation.*" [Author's abstract.]

McCready, E. B. THE NERVOUS CHILD. [Journal A. M. A., Oct. 11, 1919.]

The well-poised, efficient, emotionally stable adult is the exception rather than the rule in modern life, and procrastination as regards proper treatment of nervous and mental disorders is altogether too common. The physicians are apt to belittle the cases when first consulted, and this class of disease is insidious in its onset. Pessimistic prognoses are also dangerous. While some children are born nervous from heredity, some acquire nervousness from habits or disease and others have nervousness thrust on them through faulty home and school training. It is the physician's duty to counteract all these conditions and influences, which tend toward aggravation at puberty. There are physical anomalies—cranial or facial asymmetries, ocular defects, enlarged tonsils, nasal deviation, delayed puberty, abnormal growth, etc. Attempts to classify and label cases are useless—it is enough to say the child is nervous, and, therefore, a potential neuropath or psychopath. Its defects must be looked after as early as possible and its environment modified. Unfortunately, this is adapted to meet the adults' conditions, especially in cities, and no matter how conscientious the parents may be they may lack the training required. Most children are overstimulated in modern life, and many deleterious conditions are overlooked because they are common. Overfatigue in children brings about irritability, and the exciting conditions of urban life are liable to cause it. Diet is also important, as well as fresh air and exercise. Country life is likely to be better in all these respects than city life. The militating of nature insisted on by Seguin in the educational system is specially important and his general rules for garden schools are quoted, but his ideas, unfortunately, have not been, as a whole, put in practice. McCready promises a description of a practical method of education for nervous children, based on Seguin's theories, in a further article.

Odier, C. CAMPTOCORMIA. [Correspondenzbl. f. Sch. Aerzte., June 7, 1919.]

This classical neurotic manifestation is here discussed. As is well known this consists of a peculiar position taken by the patient resembling a bent back. His analysis tends to show that the main factors are a conscious phobia of everything connected with the fighting, and an unconscious longing for protection. The whole is thus a type of auto-

protection. It corrects itself when the patient lies on his back. At the beginning he used to apply a plaster corset for two or three weeks, but it takes so much time that Odier superseded it by *suggestion électro-psychique impérative*, which is the old familiar brutality method of the English and German electric pain used for so many years. Brilliant successes have been realized with paraplegia. Camptocormia of three years' duration has often been cured in fifteen minutes. He says the men call it "being torpedoed" and believes in this archaic way of chasing the devil round a stump.

Macris, E. VEGETATIVE DISTURBANCES IN HYSTERIA. [Grèce Med. Jl., 1919, No. 3.]

This patient following severe nightmares, contents of which are not carefully given by the author, and which followed hypnotic treatments, screamed that she was being burned, and patches of erythema developed, with phlyctenas.

Clark, L. P. PSYCHOANALYTIC TREATMENT OF BORDERLAND NEUROSES AND PSYCHOSSES. [Psychoanalytic Review, Vol. VI, No. 3, July, 1919.]

This paper takes up some practical remarks in the utilization of the psychoanalytic method in the treatment of borderland neuroses and psychoses. The types of cases studied are periodic depressions, mental torticollis and beginning schizophrenia.

In the periodic depressions it is necessary to enquire carefully into the conscious and foreconscious settings of the patient's difficulties, particularly those difficulties which seem to act as precipitating or upsetting causes in the periodic depressions. These cases are more difficult of analysis than the hysterical neuroses, but the analysis furnishes material for advice concerning readjustment and reformulation of the attitude towards various life problems. The cases of mental torticollis presented still greater difficulties not only because of the resistance, but because the roots of the neurosis were so deeply seated. In schizophrenia, the chief difficulty of analysis lay in the inaccessibility of the patient's conscious and unconscious mental life, since many of these cases presented themselves for treatment at a time when the blocking was too far advanced.

Borst, J. PSYCHOANALYSIS. [Ned. Tijdsch. f. Geneesk., 1, 1919, No. 19. J. A. M. A.]

This is an address delivered by Borst at a conference of railroad physicians, as he thinks that their special field of practice can derive great benefit from Freud's pioneer work on the origin and cure of neuroses. He describes a number of striking incidents from his own experience, and emphasizes the difference between the results obtained

with the older methods of treatment and those now realized by exploring and cleaning out the subconscious elements. Thirty years ago, for instance, he tried to cure a tendency to somnambulism with hypnosis, but the success proved transient and the somnambulism kept up. Now, in such a case, he investigates the circumstances of the first appearance of the tendency to somnambulism. This gives insight into the subconscious, and as this is brought into the light and discussed, a complete and permanent cure is realized. This we owe to Freud, he says, but Borst does not follow him to the extreme of accepting a sexual element in every case. It is this feature of psychoanalysis which has attracted our attention to it to an undesirable degree. In some of the cases Borst describes, the marriage of a sister below her rank, discovery of cheating by an employee, or a severe fright was the cause of the nervous diarrhea, hysteric instability, or attacks of depression, anorexia and nausea. He cured these patients by psychoanalysis without seeking any sexual factors. Cases of bladder and rectum neuroses, especially in young girls, often subsided permanently when the practice of masturbation was discovered and combated.

Roback, A. A. THE FREUDIAN DOCTRINE OF LAPSES AND ITS FAILINGS.
[American Journal of Psychology, July, 1919.]

The author in this study, while not denying the soundness *per se* of the principle of determinism which forms the background of the Freudian theory of lapses, questions the right to create a cause when the direct antecedent is in most cases apparent. He sums up what he believes to be the failing of the Freudian interpretation of lapses in the word *misinterpretation*. In most cases he thinks emphasis is laid on irrelevant details, while essential facts are ignored. The Freudians seem to put a premium on the introduction of as many factors as possible, leaving no room for simple explanation. There is no need of resorting he believes to unknown and hidden unconscious forces that are constantly distilling sexual and other complexes. In most cases cited where positive and negative concepts have been unintentionally interchanged, the fact is that in practically every instance the lapse is brought about by the elimination of the prefix *un* or *in*. Emphasis should be laid on the actual association in the speaker's or writer's mind between the word intended and the misexpression. When a student writes April 11, 1911, instead of April 22, 1911, what simpler and more plausible explanation may be resorted to than the fact of motor anticipation? The mistake is often *only the expression of motor habit*. [What this is, is the problem. Calling it "habit" does not explain it.] The association most frequently is verbal but may also be kinesthetic or organic. The writer would lay down the rule that first the word, sentence, or sentences preceding or following are to be examined, then possible associations that may have determined the mistake, and only

in default of such clues is it legitimate to hunt for a new principle of explanation. [Compare Maloney's careful study of mistakes in the addition tests. *Psychol. Review.*]

Rabinovitch, A. *PSYCHOTHERAPY.* [Rev. *Med. de la Suisse Romande*, Aug., 1919. Edit. *Med. Rec.*]

That the mind may dominate the body is one of the oldest concepts to descend to us. We see it realized daily, and the history of religions is filled with it, especially in the martyrdoms which are inseparable from them all. Science did not take it up until 1846, when Braid, of hypnotism memory, published his essay on the power of the mind over the body. A second birth was seen in the monograph of Liébault on the same subject, published in 1866. This author was succeeded in turn by his colleague Bernheim, whose book on suggestive therapeutics appeared in 1884. Any practitioner who had graduated in medicine up to that period knows that nothing remotely suggesting psychotherapy was taught in his day.

Rabinovitch here covers the subject of the province of psychotherapy, giving full credit to the obscure Nancy school for priority in this field, and justly, because the work of Charcot and of Breuer and Freud was directed to a very limited field, while the disciples of the Nancy professors placed no limit on the power of suggestion in the relief of disease. Among prominent neurologists to incorporate the idea into their teachings at an early date were Grasset and Déjerine in France, while Morat, the physiologist, expressed his opinion that no organ of the body could escape the influence of the cerebrum. Walthard, the well-known gynecologist, created somewhat of a sensation by ascribing many gynecological ailments to mental causes and by recommending a psychotherapeutic treatment for the same. Strümpell and Krehl, among distinguished internists, teach that many cardiac troubles are psychically motivated and curable; while the late Ivor Bang believed that the blood picture could be altered by emotional states, and Elliot has recently traced blood states to emotional influences and mental shock. In these cases it is not a matter of theorizing, but of fact, for Bang has averted these blood alterations by anesthesia of a special type. Dide and Witry have individually shown the psychogenic motivation and curability of certain acute edemas. In 1910 Vogt was able to produce pemphigus blebs by suggestion. The inevitable result of these documents is that it becomes increasingly hard for any advocate of rational therapeutic procedures to exclude the possibility of "psychic stimuli."

Mygge, J. *WEATHER AND THE NEUROSES.* [*Ugesk. f. Laeger*, 81, 1919, No. 31. *J. A. M. A.*]

Mygge remarks that twenty years ago any physician who ascribed pathogenic importance to meteorologic conditions was ridiculed, but the

progress of science, heliotherapy, etc., have demonstrated the importance of such factors. He presents further evidence to sustain the assumption that the periodical transient and apparently unmotivated pains and other ill feelings of which certain persons complain are connected with certain changes in weather conditions. They are mostly persons with a predisposition to rheumatism or joint troubles. It is not correct to call them "barometer individuals" as the changes in air pressure are not what causes the attacks, and an indirect action of heat or cold cannot be demonstrated either. It would be more accurate to call them "electroscope" or "electrometer people," for there is much to sustain the assumption that there is a causal connection between the attacks and certain changes in the electrodynamic state of the air, such as is manifested in the so-called convection currents which accompany formation of rain, snow, hail, fog, etc. He adds that it may yet be possible to obtain some control over these currents in inhabited localities. Systematic research in this line may lay the foundations for study of the electric life of the cells, and when the time is ripe for this, there may develop a theory of electrodynamics of which there are already glimmerings scattered through medical literature. The influenza epidemics point that way, as the assumption seems plausible that only atmospheric changes or something of that nature can explain the sudden acquiring of virulence the world around by ordinarily harmless saprophytes, or the sudden lowering of the resisting power against these saprophytes. Mygge suggests coöperative study along these lines by physicians and meteorologists.

2. PSYCHOSES.

Menninger, Karl A. GENERAL PSYCHIATRY FOR THE GENERAL PRACTITIONER. [Topeka, Kansas.] 1. A Simple Classification of Mental Diseases. 2. Mental Disease After Influenza. 3. The Treatment of Mental Diseases. [Journal of the Kansas Medical Society, Sept., Oct., and Nov., 1919.]

Why is psychiatry unpopular among the majority of the medical men of the country? Why is there a paucity of interest and a disregard of progress made in the study of nervous and mental disease?

The writer (Secretary of the Kansas State Commission on Mental Hygiene) attempts in these three articles to answer this inquiry, and to take a step in the solution of a problem pressing enough in every locality. He ascribes the blame in part to the practitioners themselves, who although admittedly lacking in proper medical school instruction and in active clinical material and opportunity, are nevertheless willfully blind to the fact that "diseases" of the mind are quite as capable of being put into well defined groups with appropriate names (diagnoses) courses, treatment and prognoses as are diseases of the body." A greater culpability, however, he ascribes to psychiatrists and "pseudo-

psychiatrists" who "overwhelm the general practitioner who thinks he has a case of 'insanity' with an onslaught of verbal monstrosities in lieu of diagnosis, a vertiable barrage of logomachical frightfulness!"

"I emphasize the term 'pseudo-psychiatrist' because I do not believe that modern psychiatry countenances that sort of thing. It is the aim of those of us who are desirous of seeing psychiatry reach the place in medical life that we think it deserves to disseminate knowledge of mental disease among the medical and lay public, rather than to withhold it from them by making it more mysterious and more dismaying. It is certainly not the spirit of mental hygiene to put the doctors more in the dark about these things, but to help them to be less so."

With this *apologia* the writer proceeds to a brief and simple presentation of the various forms of mental disease, following the Eleven-Major-Group classification of Southard (but amended to include a twelfth group of Paranoid Psychoses).

The second paper, continuing the theme of exposition, deals with the psychiatric sequelæ of influenza with which so many practitioners and specialists were last year obliged to deal as best they might. This article is a brief and simplified summary of the writers studies "Psychoses Associated with Influenza" appearing in the Journal of the American Medical Association, the Archives for Neurology and Psychiatry, and the Archives of Internal Medicine.

The third paper deals in a similar way with general treatment methods, considering the twelve diagnostic groups as capable of generic principles of therapy. For this rather ingenious method of presenting the subject, the scheme of classification deserves more credit than the writer.

A point of some interest is the author's plea for an institution for the custody of psychopaths, "... not sick enough for a hospital, nor perhaps bad enough for the penitentiary, even were that justifiable 'treatment,' not yet crazy enough for the state hospitals for insane. They are usually not rich enough to go to private sanitariums, nor are they ever 'feeble-minded' enough to go to the state institution for training defectives." [Author's abstract.]

Mouchet, E. BIOLOGICAL PSYCHOLOGY AND BRAIN LOCALIZATION.
[Prensa Méd., Vol. 6, No. 2. J. A. M. A.]

Mouchet is professor of abnormal psychology at the University of La Plata, and he remarks in the course of this study of the localizations in the brain that we are less certain about them now than we were a few years ago. Instead of a lot of pigeon-holes for different functions, psychology is progressing toward acceptance of the great unity of our mental life although recognizing zones of special functioning. He insists that we must not depreciate the importance of the white substance of the brain; injury of the former may modify functioning as seriously

as injuries of the cortex. He explains how the blood not only nourishes and warms the brain and maintains the pressure, but it also brings hormones to act on it. The hormones are likely to be very important for the functioning of the brain cells. When the stimuli from the hormones predominate, our action is instinctive; when the stimuli from the nerves predominate, our action is under the control of the mind, but the brain is always under the influence of both. When an action is repeated through generations, it comes to be performed with less and less attention from the senses. The hormones alone are able to accomplish it. He asserts that the hormones poured out into the blood "are responsible for the state we call love, desire, appetite, etc. If we remove the glands that secrete the hormones involved, the instinct is lost, and the mental state we call eunuchism is entailed. This hormonal basis underlies the emotions and the intelligence which orient and civilize instinct. Each one of us is kindly or malicious, an imbecile or genius, brave or cowardly according to his entrails and his humors. The hormones are the primary cause of instinct, the voice of our ancestors; our eyes and ears direct and civilize the hormonal action." The hormones act on the brain throughout. The mental states which are the result of their stimulating action cannot be localized at any special point but must involve the whole of the brain mass. The point where a nerve starts, and the region immediately around it, naturally become more or less specialized in the direction of the movements of the muscle innervated by that special nerve, or in the sensations transmitted to that point by different nerve impulses. But with hormones, there can be none of this isolated, partial action. "This explains the unity of our world, of the whole of the workings of the psyche. It is the unity of the Ego in opposition to the unity of the external world, the Non-Ego."

Bolton, G. C. BLOOD ANTITRYPSIN IN PSYCHIATRIC-NEUROLOGICAL DIAGNOSIS. [*Monats. f. Psych. u. Neurol.*, Vol. 43.]

Bolton's study here detailed attempts a separation of hysteria from dementia præcox on the basis of the antitrypsin titer test of the blood, which he states is normal for what he calls "functional" neuroses but which he finds increased in what he terms dementia præcox. In so-called organic epilepsies he finds the blood antitrypsin increased but such an increase is not present in the non-deteriorated epileptic.

v. Monakow, C. BIOLOGY AND PSYCHIATRY. [*Schweiz. Arch. f. Neurol. u. Psych.*, Vol. 4, No. 2. J. A. M. A.]

Von Monakow's extensive article is an attempt to bring psychiatry out of its place apart—according to the general acceptance of psychiatry at present—and have it take its proper place among the other departments of medicine. He seeks to demonstrate the logical physiologic

connection between the brain and the psychic and nervous symptoms. This would simplify medical thinking, and if it can be corroborated by physiologic facts—which he thinks is fairly well established to a certain extent even now—the physician will be protected against many erroneous and lay interpretations of so-called nervous conditions, and the way will be smoothed for the diagnosis and rational treatment. He declares that under the influence of toxic action not only the mechanical innervation but the emotions and instincts can be completely transformed. The toxins responsible for this may come from without or may be generated in the body. Morphologic changes, alone or combined with disturbance in the internal secretions, may entail an embryologic retrogression, a retrograde generation of psychic functions which may lead to actual loss of functional continuity between the various centers or neurons of the cerebral mechanism. He reiterates that along with the biophysical Abbau of function we must recognize a biochemical Abbau. This latter may be irregular and migratory. The effect is a retrograde generation, a dropping back into earlier phases of psychic development, even back to infancy. But this dropping back does not affect all the elements of the mind in the same measure, and this results in great incongruities. The dropping back may be only temporary or it may be permanent. The reaction, he asserts, is always a defensive reaction. The psychosis in all its forms is merely this defensive reaction, plus possibly compensatory effects. It always represents the self-defense of the individual against the injurious influences acting on the central nervous system. These primary and secondary reaction conditions thus all conform to biologic-psychologic laws. He claims that these views provide for the first time a foundation on which can be built a bridge between the brain, the organ of the psyche, and the symptoms of mental impairment. This biologic-physiologic mode of thought, keeping in constant touch with physiology and anatomy, will open new fields for research, especially on the choroid plexus, cerebrospinal fluid and biochemistry in general as factors in psychoses.

Southard, E. E. PSYCHIATRIC DIAGNOSIS. [Journal A. M. A., Oct. 25, 1919.]

The author finds the general practitioner has a too limited appreciation of psychiatry, as a rule. He feels his education in this line deficient, and any postgraduate instruction practically impossible, and thus develops a sort of general *psychopathophobia*, and an objection of the terms of the specialty, or an *onomatophobia*. Southard supports his opinion by the results of an examination made by him of 500 brief descriptions of mental patients sent to the psychopathic hospital under the Massachusetts temporary care law. He gives example of reports made by neurologists which are somewhat informative and show the effect of the German psychiatry, but do not indicate special qualifica-

tions as to the diagnosis of the types of mental disease. Others by general practitioners, and even from very good general hospitals, are not so useful and informatory, and he mentions especially one exception which surprised him, but turned out to be from one of their own former interns of the Psychopathic Hospital. Grossly inaccurate use of phrases is common, and odd ideas as to etiology are not infrequent. The internists of the general hospital staffs, need reëducation or at least brushing up of their psychiatric knowledge.

Rawlings, E. COLLOIDAL GOLD TESTS IN PSYCHIATRY. [Am. Arch. Neur. and Psych., Vol. 2, No. 2. J. A. M. A.]

An analysis is made by Rawlings of the colloidal gold reaction in 498 cases of various psychoses in which there was suspected a nervous syphilis from the clinical findings of pupillary changes, exaggerated or lost reflexes, speech defects, histories of early cardiovascular involvement or apoplexies; with miscarriages, stillbirths, defective mental development or more frank syphilitic manifestations in the immediate relations. No case was punctured which did not show either a positive Wassermann reaction of the serum with suggestive neurologic symptoms, or neurologic symptoms which made dependence on a negative serum inadvisable. The following results were obtained; One hundred and three patients gave paretic curves with positive Wassermann reactions of their serums or spinal fluids, or both; ten gave suggestive curves of incipient paresis with negative Wassermann reactions of serums and spinal fluids; fifty-three gave syphilitic curves with positive Wassermann reactions of either serum or spinal fluids, or both; 118 gave syphilitic curves with negative Wassermann reactions of serum and spinal fluids; 209 patients gave negative gold reactions, fourteen of whom showed positive Wassermann reactions of the serum and three positive Wassermann reactions of the spinal fluids; five gave atypical curves, several of these being treated cases. Rawlings concludes, therefore, that the spinal fluid of cases of dementia paralytica causes a quite characteristic curve with the colloidal gold solution which is of such frequent occurrence as to be diagnostic. In seven cases the diagnosis was confirmed by necropsy. The spinal fluid of taboparetics may normally give syphilitic curves or rather low paretic curves. Cerebrospinal syphilis gives a curve which may be considered diagnostic. Syphilitic curves with negative Wassermann reactions of serums and spinal fluids may be obtained in cerebrospinal syphilis, the reaction not necessarily being due to a dialyzable substance other than syphilitic. The gold curve is of value in clearing up the etiology of old arteriosclerosis with negative Wassermann reactions; necropsies having demonstrated a syphilitic type of vascular lesion in cases giving syphilitic curves and a simple senile degeneration of the vessels in cases giving negative gold reactions. It is of interest that five cases of

Huntington's chorea gave negative gold reactions, one of which, however, demonstrated pathologically an inactive moderate tabetic involvement of the lumbar regions. The syphilitic curve may be of value in clearing up the etiology of mental deficiencies after an active syphilitic process has ceased and antibodies have disappeared from the body fluids. The globulin reaction is rather uniformly strongly positive in paretics and a fair proportion of syphilitics, but there appears to be no definite relationship between the curve and the strength of the reaction.

Bleuler, E. PSYCHOLOGICAL TREND IN PSYCHIATRY. [Schweiz. Arch. Neur. u. Psych., Vol. 2, No. 2.]

In this suggestive and yet very simple paper Bleuler emphasizes the aid that psychoanalysis has brought to psychiatry in the study of the traumatic neuroses, especially in bringing out the more or less hidden motives, not only in the civilian but especially in the soldier who would avoid the dangers of war. He is not one who has the superficial view that these patients are semiconscious malingerers. Certain of the neuroses are, as Babinski well shows, unconsciously taken over from the physician who is untrained, but even in these there is something behind the suggestion. He makes a plea for psychic anthropology, or as Jelliffe has called it "paleopsychology," and maintains that such studies are much more advantageous than bone measurements. Excessive zeal to reform the world, which, as Protagoras would remind us, is reforming itself, is usually a sign of a mental anomaly of the reformer.

Graves. THE USE OF CALCIUM IN EXCITED STATES. [Journ. Ment. Science, April, 1919.]

Graves writes, quoting Bayliss, that calcium is necessary for the normal effect of adrenalin on sympathetic nerve-endings.

Assuming that in acute excited states there can be no lack of adrenalin in the body, but an absence of its fixation "ion," the writer gave calcium lactate in 0.6 gm. doses to many patients with more or less acute excitement. The cases include, of the manias, epileptic, simple, delirious and recurrent; agitated melancholia and recent acute hallucinations. The effect of the drug was to calm the mental state and improve the physical condition. A rapid, weak pulse becomes slower and stronger, diarrhea ceased or improved, dry harsh skin became moist and supple, the appetite also was improved. The younger the person the better the results; similarly, the more recent the disorder, especially if of influenzal causation. Some patients have responded, although over forty years of age.

Menninger, Karl A. CYCLOTHYMIC FUGUES; FUGUES ASSOCIATED WITH MANIC-DEPRESSIVE PSYCHOSIS. A CASE REPORT. [Journal of Abnormal Psychology, XIV, 1919, 54.]

Fugues, or schisms in the realm of personal identity, are classically observed in hysteria. Their occurrence in alcoholic, epileptic and

schizophrenic psychoses are recorded, and even fugues in persons not demonstrably psychotic are familiar, the latter the more so through the agency of lay journals. Fugues with cyclothymic or manic-depressive psychosis, on the other hand, are exceedingly anomalous. The author found no references in the literature to such phenomena. An illustrative case, studied at the Boston Psychopathic Hospital is presented in detail. The patient was a Jew of thirty, of frankly cyclothymic temperament. The first known act of the drama was a psychotic episode at the age of twenty-three which was probably a manic phase. It was succeeded by two fugues, practically successive, in which he disappeared entirely for two years. He recovered his personal orientation, returned home, and began a new work at which he was successful. The history of his life and travels during the previous two years remained a mystery to him and to all his acquaintances. He then developed a typical manic phase episode of manic depressive psychosis, and during this period (at which time he was first seen and studied by the author) he became grandiloquently expansive, identifying himself with the Creator, and as such related in detail the events of the fugue of two years from which he had so recently emerged! This was followed by a hypomanic period which shortly terminated, and he was discharged. For a time, then, he was quasinormal, mentally, and returned to his work of selling bonds. During this interval he recollected quite well his narration of the events of his fugue, but much to his bewilderment he had again lost all memory of the occurrence of the events, themselves. Soon after this he began to experience twilight states in which he would "find" himself in nearby towns, without memory of why or when he came, evidently the result of a brief fugue. He petitioned for voluntary commitment and after a month was again discharged, and exhibited after a short period of apparent normality a mild depression, a picture familiar enough, for which the cognitive hypomelancholia is suggested. This brings the case up to the present time. The case reported is of interest for its rarity, if not priority [? Ed.], in the association of fugues with a cyclothymic psychosis. Theoretical deductions are not dealt with by the author, but the unusual character of the case is emphasized by consideration of the known facts about cyclothymia. In this disorder emotional disturbance is the *sine qua non*; usually, but not always it is accompanied by volitional aberrancies. But it is exceedingly unusual in manic-depressive psychosis to observe profound disorder of intellectual processes, true amnesia, disorientation, etc. Such apparent repression or acceleration of thought processes usually present (waiving the interrelation of volitional disturbances) is by no means comparable to such disruption as loss of personal orientation and identity? Moreover in the case cited these *paragnostic* episodes did not coincide chronologically with the *dysthymic* periods; he was not "*fugue-ing*" during but *after* his manic attacks.

The question might be raised as to whether, after all, the fugues were not independent of the cyclothymia. This is difficult to sustain in the face of the revelations made of the previous fugue *during* a succeeding psychotic period, and, by corollary, the amnesia for these narrated events with memory for the narration. Granting the correctness of the diagnosis, which seems fairly well established, the interrelation, however unusual and inexplicable, seems incontrovertible, and the designation of the author, "Cyclothymic Fugues" thus far justified. [Author's abstract.]

Tracy, Edward A. EPILEPSY IN SCHOOL CHILDREN. [Boston Medical and Surgical Journal, Nov. 6, 1919.]

This paper reports briefly a survey of epilepsy made in three Boston school districts, comprising 2,786 pupils in grades from the kindergarten to the eighth. Shanahan has made the statement that, "Conservatively speaking, every two or three per thousand of the average population are epileptic." Among the 2,786 children examined there were found nine epileptics. This gives a proportion of 3.2 per thousand school children. Brief histories of the cases found are given in the paper. This abstract copies one of them, Case 4. It illustrates the accuracy of diagnosis made possible by noting the objective signs Tracy has found to be present in this disease, as in this case a positive diagnosis of idiopathic epilepsy was made nineteen months before the boy's first convulsion. The objective signs of idiopathic epilepsy are described by Tracy in the Boston Medical and Surgical Journal, Nos. 23, 24, 25, and 26, Vol. 78, 1918.

Case 4, referred to above, reads as follows: "A. J. Male. Aged ten years. Had bronchitis at six months, whooping cough at two years, and measles at seven years of age. Maternal aunt is an epileptic. In June, 1917, commenced to have dizzy and fainting spells. He would become 'deadly white' and fall. Twice he had two attacks on the same day. He suffered so frequently from dizzy spells that his mother ceased from sending him on errands for fear something might happen to him. Examination showed chronic vasoconstriction spots and abnormal sympathetic reflexes. The boy's mother was informed of the diagnosis—incipient idiopathic epilepsy. Under treatment his dizziness, pettishness, and fainting spells ceased. After six months the mother concluded there was nothing the matter with the boy and stopped medication. After a few months without medication, the dizziness and fainting attacks recurred, and again yielded to treatment. Again the mother neglected to continue medication, and on May 25, 1919, witnessed her son's first convulsion. This has awakened in the mother a realization of her neglect to follow medical advice, and it is hoped she will henceforth be more persistent in following it. Incidentally it confirmed the accuracy of the diagnosis made nineteen months before the first attack of convulsions." [Author's abstract.]

Schröder, P. EPILEPSY IN WAR. [Med. Klin., 15, 1919, 229.]

In the military hospital at Greifswald ninety-seven soldiers were treated for various types of epileptic attack of which fifty-five showed no aggravation of their previous attacks, twenty-five showed an increase in the number of their attacks, and seventeen developed the phenomena while in military service. Of these some had shown a predisposition to convulsive phenomena, others had had severe injuries to the skull or had been infected with syphilis. Apart from special injuries, war service the author concludes cannot be regarded as the cause of the epileptic phenomena.

Tramer, M. EPILEPSY AND PATHOLOGY. [Schweiz. Arch. f. Neur. u. Psych., 1918, No. 2. J. A. M. A.]

Tramer's monograph is based on experiences at the national Swiss institution for epileptics and a cantonal insane asylum. He was unable to find any pathognomonic lesions with epilepsy, but, at the same time, he states that with the severer cases there is great probability that the Betz' cells will show certain changes and that marginal gliosis will be found. Also that the discovery of these morbid changes will afford some probability of a retrospective diagnosis of epilepsy, especially in cases of much mental impairment.

Gordon, Alfred. A CASE OF ESSENTIAL EPILEPSY GREATLY IMPROVED FROM AN OPERATIVE PROCEDURE AND PRESENTING SPECIAL FEATURES. [Phila. Neurol. Soc., October 24, 1919.]

H. N., age thirty-two, developed at the age of twelve epileptic seizures of a generalized character. Until six months ago the attacks occurred very frequently, from two to four daily with short intervals of intermission, the longest of which was one week. Six months ago when he first came under the author's observation he had an unusually severe attack. After recovery a distinct aphasia was observed. It was of a pure motor type (Aphemia) in which the inner speech was preserved. There was no paralysis of the extremities, no indication of involvement of motor area or its tracts. The reflexes, deep and superficial, were unaltered. The eye examination was negative with the exception of irregularity of the right pupil which according to the ophthalmologist was of no significance. Urinary analysis was negative. A Wassermann test of the blood and spinal fluid on two different occasions was negative. There was no history of venereal infection. X rays of the skull gave negative results. In view of the clearly defined motor aphasia the presumption was that a hemorrhage probably took place over the left Broca's convolution, patient being right-handed. On the thirteenth day of its existence the aphasia remained unaltered, contrary to what is usually observed in cases of aphasia occurring in the course of epilepsy. In the majority of instances it is temporary and

transient, similar to the paresis of one or two extremities which sometimes occur in epilepsy. They are all due to a temporary inhibition of the corresponding centers and of their tracts. In view of the persistence of the disorder a lesion in the form of hemorrhage was thought of. Operation was advised and promptly accepted by the patient. An osteoplastic flap was removed from the left side of the skull over the fronto-parietal region. A hemorrhagic focus was found over the lowest portion of the third frontal convolution. Rapidly the patient's speech commenced to improve and in three or four weeks returned almost to normal. For four subsequent months there was no convulsive seizure. Due to some indiscretions in sexual matters and to an enormous meal in the same evening he became ill and had his first convulsive seizure since the operation. His speech again became aggravated. During the last two months there have been no epileptic attacks. Presently the patient showed some disturbance in motor speech and absolutely no other abnormal condition. The case is interesting from several standpoints:

1. The occurrence of a hemorrhage during an epileptic attack over Broca's region producing a persistent motor aphasia. This condition is very exceptional.

2. Arrest of persistent convulsive seizures of a violent character following an operative procedure on the skull.

3. A practical question arises as to the advisability of performing a cranial decompression in essential epilepsies even without focal and well localized symptoms (that the intracranial pressure in all epilepsies is elevated is a well-known fact. [Author's abstract.]

Wells, F. L. PSYCHOGALVANISM IN THE ANALYSIS OF STUPOROUS CONDITIONS. [Psychoanalytic Association, 1919.]

The apparatus included a Leeds & Northrup D'Arsonval galvanometer and various types of electrodes. The reactions observed are a change of body potential or resistance, in response to specific stimulus. Various sensory and ideational stimuli were used. Observations with twenty normal and five manic-depressive stupors are presented. A slight slowing only of the latent times is possible as a concomitant of the psychomotor retardation. Mental associations are formed with about the same rapidity as in health. The retardation may lie in a lessened complexity of the associations formed, or in slower and feebler conversion of these associations into motor expressions. [Author's abstract.]

FORENSIC NEUROLOGY

Roesler v. Shastri. FRAUD IN HYPNOTIC TREATMENT OF INSANE DELUSIONS. [J. A. M. A.]

The Supreme Court of Wisconsin reverses a judgment that was rendered on a verdict directed for the defendant, and remands for a new trial this case in which the plaintiff sought by replevin to recover a bank

draft for \$950 alleged to have been obtained from him through fraudulent representations by the defendant. The court says that the plaintiff was a farmer whose wife had been suffering from insane delusions for thirteen or fourteen months and had been at a hospital three times. He engaged the defendant to treat her. He testified that the defendant held himself out as a doctor, and was called such, and it appeared that the defendant had used the title M.D. on his letter heads; that he represented that he could by the use of hypnotic influences cure the plaintiff's wife, but that he must first destroy her mind, and make it like a child's and then build it up again. He assured the plaintiff that he could cure her, but he had to have \$50 per day. At the end of twenty days the defendant said she was cured 50 per cent., but that he could not stay longer, and was given the draft and \$50 in cash. It appeared that the defendant was a native of India; that he had been educated as a physician in the University of Binjab, and had pursued some medical studies in Chicago and Los Angeles, obtaining a medical degree from the latter school; but he had not been licensed to practice in the United States. He claimed that he used hypnotic suggestion only in his treatment of the plaintiff's wife, and denied that he had said that he could cure her. The supreme court thinks it was error to direct a verdict in this case. It was a question for the jury to say whether or not plaintiff was deceived by the defendant. The jury had a right to believe the plaintiff's testimony, and to draw the conclusion therefrom that he was defrauded of his money. He had an insane wife; that he was anxious to cure her was evidenced by the fact that he willingly paid \$50 a day in an effort to do so. He was undoubtedly ignorant of what could or could not be done through mental healing or hypnotic suggestion. There is a sharp conflict of views on that subject by those who have given it study and attention. That he did not know was not strange. Neither was it strange that he was unable to diagnose the exact or relative condition of his wife's mind at the time the draft was delivered. He had been told that her mind must first be wholly destroyed, and then built up, and he evidently believed that. The law protects the ignorant and credulous, as well as the wise and wary. He was told by the defendant, when the latter received the draft, that her mind was 50 per cent. cured, and that the nurse could take care of her afterward. We employ doctors to diagnose disease, and to cure it or direct us what to do to effect a cure. That is their profession. When they give advice, the patient is justified in following it, unless it is so palpably contrary to sense or human experience as to be disbelieved by every one. There was sufficient evidence in this case to warrant the jury in finding that the defendant held himself out as a doctor. A letter from him to the nurse, which was shown to the plaintiff, with the heading "K. D. Shastri, M.D." and was signed "K. D. Shastri, M.D." He was called doctor, and made no protest. The fact that he was not required (in Wisconsin) to be licensed

to heal by mental science or hypnotic suggestion was immaterial on the question of actual fraud. An unlicensed person may make fraudulent representations.

The plaintiff should have been permitted to show by other doctors, if he could, that the treatment given his wife by the defendant was injurious, and not beneficial. It was true that the defendant's counsel on the trial admitted that she was neither cured nor benefitted. But the plaintiff's offer went farther. He offered to prove that she had been injured by the treatment. Such proof was pertinent on the issue of fraud and should have been admitted. Claim was made that since, in delivering the draft to the defendant, the plaintiff parted with the legal title thereto, he could not maintain replevin to recover it; but this court has several times negatived that claim, and held that replevin will lie to recover goods obtained by fraud.

Book Reviews

Frazer, James George. FOLKLORE IN THE OLD TESTAMENT. STUDIES IN COMPARATIVE RELIGION, LEGEND AND LAW. In three volumes. London, Macmillan and Company, Limited, 1919.

Physical medicine first, mental medicine more recently has been led to a sure conviction. This is that disease and readjustment of the physiological or psychic personality, which is the return to health, depends in greater or less degree upon knowledge and recognition of underlying fossils or "relics of ruder times." This is particularly true of mental disease and the understanding of mental life though here these relics are not fixed fossils, except in their outer systematized forms, but remain active unconsciously modifying and often interfering with actions and reactions more suitable to modern life. A study of such a residue of former ways of thought, like this of Frazer recognizes the genetic growth of these mental factors and their modification up through human history in accepted religions, social customs, marriage and other laws dependent upon these active dynamic factors and their continued activity. Such a study therefore becomes indispensable for the complete understanding of human life and of the difficulties into which it falls. The successful psychopathologist cannot neglect this more complete study of man and his mental development. For he finds by analysis that just as Frazer discovers these similar elements and methods of thought and affectivity at work in all parts of the race in one form or another at all times, so these things are still active in influencing the successful adjustment of the individual to society, which results in health and efficiency, or in disturbing this adjustment and making him ill. These things still pertain, as Frazer has shown us, in the social unconscious also, even in its consciousness which laggingly obeys affective superstition rather than reason and so confuses the individual's attempts at adjustment and health.

In these new volumes Frazer offers much of the vast lore of peoples of every time and place, when and wherever the primitive affective type of thinking still prevails. He illustrates freely the fundamental basis of affective and instinctive reaction which laid the foundation of primitive thinking and belief and determined largely the character of human behavior. This influence on behavior is still more prevalent than man would think and prevailed largely underneath the gradual growth of a more rational attitude toward man's own nature and his environment, which has only gradually and partially superseded the older form of belief and thought. These books reveal to us, however, beside this

added weight of testimony to the affective side of human history, the growth out of this and through this of a more intellectual attitude, which has haltingly and imperfectly won control and established a more and more workable form of religion and of regulating law, as for example, in the evolution of marriage customs which have served to break through the older closer association within the family group.

Frazer has followed the course of particular phases of this development by choosing certain larger topics comprised in the Hebrew scriptures. Around them he has gathered his comparative material by which he shows the place of underlying trends in Hebrew history in the community of human thought everywhere, at the same time that he reveals the particular development and rationalization these received as they took their place in the growth of the Hebrew religion. He points out first the twofold narrative contained in the scriptures, the one representing the naïve and picturesque material, even the form of folklore and tradition, the other the intellectualized form into which this earlier material was compressed by the later priestly instructors of the people.

The story of the creation finds its many parallels in the lore of all peoples, a form of archaic primitive myth which reappears in the dream material of psychoanalysis as well as in the conscious mudpie activity of childhood. The entrance of death into the human paradise has its counterparts all over the world, as does also the participation of some fabled animal, in the Bible the well known serpent. The chapter on the mark upon Cain affords interesting material in regard to the first status of the murderer in human society. Here as in so many of Frazer's investigations we are brought to that sense of positive values underlying our since altered conscious conceptions of things in which we often see only the negative side. In order truly to understand the human factors active in society today, which consciously often produce only opposition and self-defence, it is necessary to realize that a certain positive character associated with individual need and a social need of a different time established certain reactions, like the murder impulse, which for changing social reasons is no longer useful and now must be differently controlled. This same principle is somewhat similarly illustrated in the discussion of ultimogeniture as a previous social institution to primogeniture, in which discussion Frazer puts the story of Jacob and his apparently tricky circumvention of his elder brother into a quite new light.

Significant illumination is thrown upon the complicated problems lying within the unconscious complex reactions of the individual to his family group by the elaborated presentation of the gradual opening out of the family group and its original close relationships through the growth and extension of the taboo relating to cousin marriages. Marriage of a wife's sisters, as again illustrated in Jacob's story, and the marriage of a deceased brother's wife form also part of this investiga-

tion and have similar bearing. Only brief reference can be made to the chapters which take up many significant and symbolic activities and ceremonials, all of which Frazer subjects to the method of wide comparison, bringing out in each case much of the inner psychological significance of the particular form of custom or belief. This gives it reference to individual groping after the expression of fundamental need and the curious twistings and rationalizations to which this is subjected in the individual mind as in the racial groups.

Attention should be called to the high literary value of these books. This is due in the first place to the well-known quality of all Frazer's writings, to his sense of balance of evidence and of caution in regard to dogmatic conclusion and to his scientifically hospitable openmindedness and ability to see more than one side of a question. All these are in greater evidence in none of Frazer's past works than in these volumes. There is also an unusual sense of appreciation of the high moral and cultural worth of the Hebrew scriptures and of the particular form of rationalization which they have taken. There is at the same time no lack of a genuinely humorous appreciation of the absurdity of naïve and infantile forms of belief and its expression and the lengths to which this can go. A special literary and scientific value attaches to the extended chapter on the story of the Great Flood. This is a wide comparative study showing the qualities of the author's scholarship, the breadth and geniality of his attitude toward critics, opponents of his views or otherwise, and a peculiar excellence of literary grace and finish.

L. BRINK.

Rüdin, Ernest. *STUDIEN UEBER VERERBUNG UND ENTSTEHUNG GEISTIGER STÖRUNGEN.* [Zur Vererbung und Neuentstehung der Dementia Præcox.] Julius Springer, Berlin.

This is No. 12 of the Monograph Series founded by Alzheimer and Lewandowsky, and is the first of a series in studies in heredity of mental diseases concerning which the author presented some important preliminary considerations in 1911.

It deals with the problem of the hereditary factors in dementia præcox, and coming from the Munich Klinik, that disorder group is defined strictly in accordance with Kraepelin's conceptions. The material subjected to statistical analysis is derived chiefly from the Klinik and from the Bavarian asylums, most of which has been investigated clinically from the Kraepelian standpoint.

The opening chapter deals with a critical examination of methods. Rüdin maintains that the methods heretofore utilized are unavailing. The psychiatrist must break with the older traditions and not build up his conceptions regarding heredity upon the study of certain markedly affected families. Such studies lead to totally false conclusions. Well members as well as the deaths in a family tree must be considered and he maintains that the methods which have been elaborated by Weinberg are of all these heretofore described the most valuable and reliable.

Chapter two of the investigations deals with the incidence of dementia præcox [701 cases] from parents both of whom were free from any evidence of the disorder. Detailed reference is made to the following out of the methods of Chapter I. The percentage of cases is 4.48 or from 1/16-1/32 of all the children living or dead. He shows that dementia præcox or its anlage does not behave like a simple Mendelian factor in heredity. In view of the percentage which closely approximates 1/16, it is not improbable that a dihybrid crossing mechanism is involved in which two concurrent factors enter into action. Chapter three follows with an analysis of those patients with one præcox parent and one non-præcox parent. Here the percentage factor rises to 6.18. For other psychoses similar analysis shows 16.3 per cent. The relatively small material (34) forbids for the time a complete judgment but points strongly to the conclusion that a Mendelian recessive factor is in evidence.

Chapter four analyzes the material in which both parents are free from dementia præcox but one parent has some other psychosis. Here the percentage is 8.21. A similar figure is gained for children with other psychotic involvement. Further dementia præcox occurs more frequently when one of the parents is alcoholic (though not psychotic) 7.80 per cent. Other psychoses, 5.20 per cent. When the parent has some other psychosis and at the same time the same or other or both parental stems show alcoholism the percentage of dementia præcox is 15.78, for other psychoses, 7.89, or when one or both parents show other psychoses, and at the same time one or both parents show alcoholism, the dementia præcox percentage is 14.81, other psychoses, 7.80. When both parents are psychotic, independent of type, with or without concurrent alcoholism, the children show dementia præcox 22.7 per cent. He also shows that in the descendants from parents free from præcox, or other psychoses, or alcoholic but when the collateral aunts, uncles, etc., have dementia præcox then the percentage of dementia præcox children is higher, 8.07 per cent. compared with 4.48; and for other psychoses 6.83 per cent. compared with 4.12 per cent. The occurrences of other psychoses in the parents of præcox parents is not an entirely irrelevant matter but seems to bear some inner relationship to the occurrence of dementia præcox. Evidence derived from the study of half brothers and sisters also tends to emphasize the value of the Mendelian recessive generalization.

Chapter five analyzes the half brother and sister situation more carefully and emphasizes the deductions already outlined. Chapter six analyzes the evidence concerning the chances of inheritance in the child series. Whereas first births seem to show a higher percentage of incidence in the author's series, as also has been held by others, the author holds that similar adverse changes seem to involve the last born. His material however he holds is too insufficient to permit any definite conclusions.

In Chapter seven the discussion of dominance and recessive factors is taken up and the evidence for and against is recapitulated. A study of the children of twenty old dementia præcox cases from Eglfing show only two of eighty-one to have dementia præcox. Were it a Mendelian dominant at least 50 per cent. of the descendants should have developed the disease. Continuous inheritance from parent to child and then to the next generation, a striking "dominant" fact, rarely occurs and is not present in the author's very extensive material. Nor are such cases known to him in the literature. Furthermore the so-called dominant rule, once free always free, does not work out in the author's material. Collateral heredity is, as already seen, common. This is more characteristic of recessive than dominant factor inheritance.

Chapter eight deals with sex influences. The author's material shows that males and females are equally involved, with perhaps slighter prevalence of males. No definite sex inheritance factors appear in the figures.

Chapter nine deals with the problem of anticipation and the author concludes that such occurs in his material. The general anticipation age averages about 6.5 years. Whether this is a real law or a statistical artefact is still an open question. The necessary methods for study have not yet been applied to handle this problem decisively.

Chapter ten deals with the question whether a polymorphous trend or a general disposition to mental disturbance only lies in inheritance. The Weinberg methods, the author holds, are the only ones that offer an insight into this question and even with these the results are dubious. Chapter eleven deals with very complicated questions of clinical relationship and hereditary trends which cannot be easily summarized here.

The author promises to bring his entire material into presentable form some day, having here dwelt only with the statistical analysis. Family trees are omitted as they fill space only and are really only valuable through an abstraction of the results obtained. Taken all in all this study is one of the most careful and detailed bits of heredity study with which we are acquainted. We shall look forward to its continuation and can recommend the monograph to all students of hereditary problems.

JELLIFFE.

Krueger, Hermann. DIE PARANOIA. EINE MONOGRAPHISCHE STUDIE. Monographien a. d. Neurol. u. Psych., No. 13. Julius Springer, Berlin.

In spite of the great conflict the German publishers brought out a number of serious monographs in neurology and psychiatry during the war. This one appeared in 1917 and forms one of the excellent series originally inaugurated by Alzheimer and Lewandowsky and now, since their death, continued by Wilmano of Heidelberg and Forster of Breslau.

Of all of the subjects of psychiatric interest this one of paranoia has readily led. The reasons for this would probably be variously formu-

lated—but when the old Quaker is said to have remarked to his wife that “all the world is queer, save thee and me and thee is a little queer,” this aspect of “queerness” of the other fellow will probably be found to lie at the root of our interest in paranoia. The old Greeks meant by the word the mind that was queer “beside itself” and some of the classical Greek dramatists referred to certain individuals as paranoiac, who strangely enough became enmeshed in certain social situations which present-day psychiatry holds responsible for the type of illness now termed paranoia.

The present author however does not take us back so far. In fact he only starts with the present era of German psychiatry which began with Griesinger and the founding of the psychiatric clinics of that country. His historical summary, although not as rounded as it might be, is nevertheless quite readable and fairly orients the problem so far as the German psychiatry is concerned. He refers to it as a simple attempt to present the chief milestones in the development of the idea. As is fairly well known no systematist has gone so far as Kraepelin in limiting the present-day concept. Bleuler, who fairly represents the dynamic trend of modern day psychiatry, as Kraepelin heads the descriptive school, believes it is best to be included within his schizophrenic group.

The present monograph adopts a compromise attitude. Founded more or less upon an older Kraepelinian concept the general group is delimited by this brochure as including those psychoses characterized by the development of a delusional system of influence and of self-importance, logically built up and developed more or less along lines of present-day academic logical possibilities. It is characterized by its late development, its chronicity, its penetration throughout the entire personality. It develops, according to this author, on the basis of what he calls the paranoid constitution, involves the affective life, may lead to acute episodes, transitory as a rule, of great excitement or sometimes confusion, and may be accompanied by hallucinations of various types. The deterioration of the personality is not accomplished as a rule. So that formal thinking and actions is not seriously interfered with.

Three trends are here described, a *paranoia combinatoria*, a *paranoia hallucinatoria* and a *paranoia querulatoria* which are in turn richly outlined from the standpoint of a purely descriptive psychiatry.

The author's chief theme is the “paranoid constitution,” a sort of descriptive subterfuge which, while well outlined, does not really get into the gist of the individuality. Degenerative psychopathic trends is about as far as he can take us. All of this means very little. In fact the whole “degeneration” hypothesis is a bit of purely intellectualistic bumble puppy which gets us absolutely no further than our quoted Quaker's opinion concerning his own integrity of reason, although each author who attacks the problem makes a much more wordy effort at

defining "queer." Accepted standards of "queerness" at conscious levels are strange products when seen closer at hand through the study of the unconscious. The present author has no apparent use for the concept of the unconscious. He hardly mentions it, and when he does, it is apparent that the hypothesis is strange to him. Paranoia is an "exquisite degenerative disorder," he says. The foundation symptom is the development of a system of delusional ideas, the individual variation of which defies any transcribing. Two chief features he would emphasize, namely the inimical unfriendly or hateful attitude of others, which leads to the delusional ideas of influence and the development of ideas of grandeur. These develop side by side, or, in the querulent type, intermingle. Krueger would include a rich symptomatology of hallucinatory experiences—partly contributing to the delusional beliefs, or having no apparent relations to the same. It is rare he holds to have the delusional system founded upon the hallucinatory experiences.

As we have remarked the author knows nothing of, or will have nothing to do with the study of complexes, so his ideas as to the relationships of hallucinations to delusions are not of much value, since chiefly from this viewpoint has it become at all understood what the functions of hallucination and delusions really are.

Krueger then describes his three types. His *paranoia combinatoria* is made up of those paranoia cases in whom the genesis of the delusions and their further development proceeds from the paranoid psychopathic constitution with its paracritical thought method and its sick affectivity in a formal way uninfluenced by the presence of hallucinatory experiences. It is apt to begin earlier than the hallucinatory type and develops very slowly and insidiously. Ideas of influence are those more frequently appearing earlier than ideas of grandeur. The outbreak of the delusional ideas seems to relieve them from anxiety that previously influenced them continuously. The author fails to see this as a partial resolution of the inner conflict by the mechanism of projecting the difficulty outside of themselves—but, as has been pointed out, he has no dynamic conceptions, being bound up in the meaning of words, rather than the explanation of things.

The author then describes a number of delusional types which are clearly of the schizophrenic character, indicating the general haziness of his nosological conception.

Paranoia hallucinatoria contains many of the Kraepelian paraphrenic and præcox cases. Bleuler would probably group them all as schizophrenic cases. The hallucinations appear early and are closely related to the delusional system. The age of onset is about forty. *Paranoia querulatoria* is characterized by the concentration of the patient's delusional system upon the problem of justice and the social agencies of justice. The author seems to think it is a very rare type of the disease. In its mild type we are inclined to think it extremely widespread. A

rich field for investigation, namely among the half-baked social reformers, has apparently been neglected.

So far as the course, the treatment, the differential diagnosis, medico-legal considerations, etc., are concerned we find clear and straightforward treatment, but nothing that is particularly illuminating nor stimulating.

The monograph is well worth reading from the attitude of a clear setting forth of a moderate position towards the general problem of the paranoid individual.

It will offer little to the extreme Kraepelian who would essay to limit the group and hedge the concept about very sharply; again to the steadily growing dynamic school that seek more and more within the cravings of the individual the source for the symptom formations, the monograph will be found lacking in vital interest. To those of more eclectic and *laissez faire* proclivities it will be found a very acceptable and interesting summary.

The Journal OF Nervous and Mental Disease

An American Journal of Neurology and Psychiatry, Founded in 1874

Original Articles

PRESENTATION OF A MANOMETRIC OCULO- COMPRESSOR

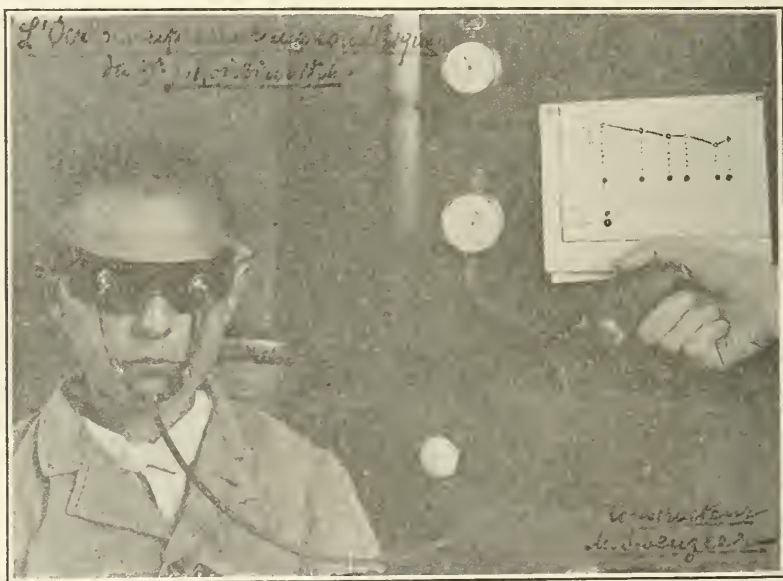
BY DR. J. ROUBINOVITCH

CHIEF PHYSICIAN OF THE HOSPICE DE BICÊTRE, PARIS

After having made up in May, 1916, a preliminary model of an eye compressor for the study of the oculo-cardiac reflex which was then kindly presented to the *Academie des Sciences* through Monsieur le Professeur Charles Richet, I have gone on with the study of the improvement and simplification of my apparatus, the new model of which I beg herewith to present to the *Société de Biologie*.

My present oculo-compressor is a manometric one. It is made of a front band of leather or inextensible cloth, fitted on its inner side with two oval rubber pouches (the kind of rubber sheet called "para"); two small curved tubes come out of these pouches, connected with other tubes of rigid rubber. A small tap placed on each of the tubes connected with the pouches allows of blowing each pouch separately. The tubes are connected by means of a T-shaped tube, with one tube terminated by a tap with three holes, which communicate with a manometer and with a rubber insufflator. To use the apparatus, you have only to apply the front band in such a manner that the pouches should bear upon the eyeballs, which should have been previously covered with aseptic gauze. The front band, being slightly curved in the middle, can easily fit the bridge of the nose. The pouches, moreover, by means of slides prepared in the band, can move to right and left, and thus can be adapted to any shape of the orbits. When the band is in position, it is fastened behind the head by means of a buckle. Then the several taps should

be opened and the insufflator is used according to the indications of the mercury manometer: one may compress the eye globes from one up to thirty or thirty-five centimeters of mercury. Should one wish to stop at a certain degree of compression, the insufflator is worked up to the desired degree and then the three holed tap is turned off close to the insufflator. Should one wish to study the effects of monocular compression, one has only to shut one of the taps placed on the tubes near each of the pneumatic pouches.



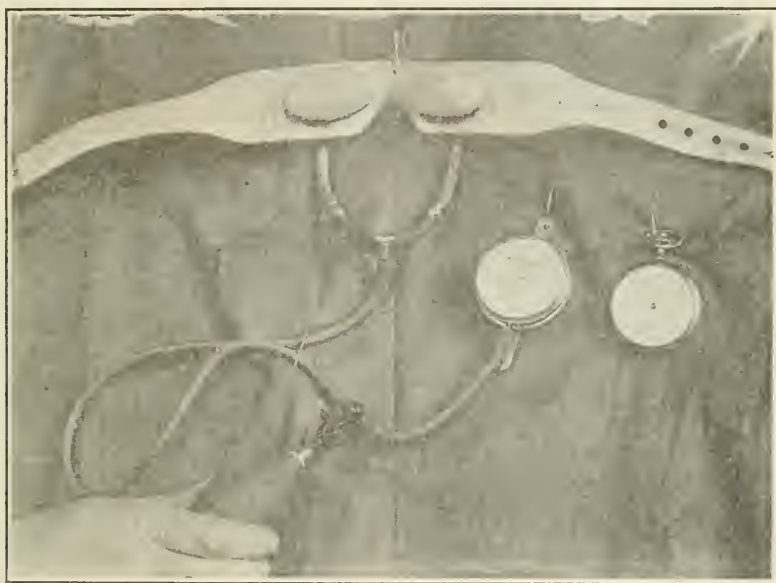
The apparatus can be kept in place at the desired degree of compression as long as it is deemed necessary by a competent operator.

It is easy to realize that the manometric oculo-compressor, thus obtained, allows one to compress the eyeballs in a manner which is at once easy, regular, progressive, regressive, measurable, comparable, durable and aseptic. The operator or physician, may, moreover, use it by himself without requiring any help.

The adaptability of the apparatus fits it for use upon animals after a few slight modifications easy to contrive. For instance the apparatus can be adapted to any form of muzzle used in experiments upon dogs.

Among the details which characterize this manometric oculo-compressor, there is one which deserves special notice. At a certain degree of ocular compression—a degree which varies with each individual—the oscillations of the manometric index are isochronic

with the radial pulse. Thus may be observed the beats of the ophthalmic artery which, by means of a sphygmograph fitted upon the course of the oculocompressor, might be very easily registered. One may, also, simply by a chronometric estimation of the oscillations of the manometric index calculate the modifications of the ophthalmic pulse under the influence of more or less intense compression.



The apparatus enables the operator to draw the graphic curves indicating the number of cardiac pulsations in one minute under the influence of compressions of variable intensity, going, for instance: from nought to five, ten, fifteen, twenty centimeters of mercury . . . such as I have had drawn up in my Hospital, either on patients considered as normal, or in a certain number of cases of infantile encephalopathy, or again in cases of general paralysis and tabes in adults.

In cardiac pathology, the apparatus may be used for the diagnosis of functional troubles, according to the researches published in 1916 by Dr. P. Emile Weil, Lanbry and Harvier and by Mr. Arsollier in his thesis for the Doctorate at Bordeaux in 1919.

Lastly, several authors (M. M. S. Mongeot in 1914, Camille Lion in 1915, Charles Achard and Leon Binet in 1918, Loeper and Mlle. Weil, G. Guillaïn and Dubois) having brought into notice the therapeutic use of the oculo-cardiac reflex in the tachycardic crisis, tremblings and anormal movements of the athetosis, etc., the manometric oculocompressor can prove to be fitly employed in all such cases.

A CASE OF HEMANGIOMA CAVERNOSUM OF CEREBRUM

BY S. UYEMATSU, M.D.

ASSISTANT IN PSYCHIATRIC CLINIC AND RESEARCH LABORATORY, MEDICAL
DEPARTMENT, TOKIO IMPERIAL UNIVERSITY

INTRODUCTION

Since Luschka, in 1854, published a case of hemangioma cavernosum of the central nervous system, cases have been observed and reported by various observers, such as Bremer, Rossolimo, Bielschowsky, Engelhart, Bruns, Struppler, Creite, Oliver and Williamson, Sweasey-Powers, Lewandowsky and others. These cases, so far as the writer was able to learn from the literature, are not more than fifteen. The reason why the reported cases are rather scarce in comparison with other tumors of the brain may be explained thus: On one hand this tumor may be of very rare occurrence in the central nervous system, and on the other hand it is possible that the greater percentage of the cases do not come to necropsy because this tumor does not show pronounced clinical symptoms and is difficult to diagnose. As a matter of fact, more than half of the cases reported were observed accidentally when the brain was dissected. Three to four cases had displayed Jacksonian or genuine epileptic convulsions. Two cases, only, showed tumor symptoms. Nevertheless as autopsy cases increase and the pathological effects of this tumor are more thoroughly studied, it will not be impossible to make a correct clinical diagnosis.

In order to show the general character of this tumor some important observations and opinions of various authors will be briefly given.

1. Oppenheim, in 1913, demonstrated four patients who were diagnosed as having cavernous hemangiomata. According to this author, the cavernous hemangioma is to be attributed to a congenital malformation. Symptoms due to increased intracranial pressure are either absent or very slightly expressed. However, this tumor often shows focal symptoms due to secondary congestion or hemorrhage. In most cases patients are apt to show various anomalies or malformations in the circulatory system. It is not uncommon for the patient to show hemangioma telangiectasia or capillary

ectasia, particularly over the head or the face. By these characteristics, the author says, it is not impossible to give a correct clinical diagnosis for this rare tumor.

2. In 1911, Astwazaturow studied two cases of cavernous hemangioma of the cerebrum. Surveying these two cases together with those already reported, the author advanced the following conclusions with regard to the etiology, pathology and symptomatology of this neoplasm.

(a) Cavernous hemangioma is usually found in the brain substance near the pia mater and appears to have developmental relationship with the latter structure.

(b) Calcareous deposition is observed in the majority of cases in the cavernous wall and in the walls of the capillaries, which show extreme hyperplasia.

(c) Trauma is considered as one of the etiological factors.

(d) This tumor is characterized clinically by absence of general tumor symptoms, even when the masses occupy a remarkably great area. Epileptic symptoms are observed in the cases which show temporal lobe involvement and could be regarded as a local temporal lobe symptom. In cases in which tumors are situated outside of the temporal lobe, epileptic symptoms are only very rarely encountered, and if present, can not necessarily be considered as of etiological moment. On the other hand it is common for epileptic patients to encounter trauma which might lead to the secondary development of the cavernous hemangioma.

(e) As this tumor grows slowly while destroying and replacing the brain substance it does not cause an increase of intracranial pressure.

(f) Women appear to have greater predisposition than men.

(g) Because of the tendency of calcareous deposition this tumor may occasionally be diagnosed by the x ray method.

3. In 1913, Sweasey-Powers described a case of hemangioma cavernosum found in the centrum semiovale. Concerning the nature and etiology of this tumor, this author's opinion differs from that of Astwazaturow. The embryonic developmental anomaly is regarded to be a main endogenous factor. At a certain time, from some cause or other, the congenitally misformed tissue is supposed to begin an abnormal growth and to form a characteristic blood vessel tumor of cavernous structure.

These are only a few representative opinions given from a number of observers.

The writer has seen a typical hemangioma cavernosum in a

brain in which he found an abnormality of the pyramidal tract and reported it as such. At that time this tumor was not described in detail, since it was not the purpose of the paper. However, as mentioned above, this tumor being very rare and not much being known, especially with regard to its genesis, the case has been thoroughly studied and is to be published separately.

STUDY OF THE CASE

Clinical Symptoms and Necropsy Findings

Ancestry, previous personal history, status, course of the disease, general necropsy findings, etc., were precisely described in the writer's previous paper on "An Anomaly of the Course of the Pyramidal Tract." In order to avoid repetition only the data which appears to be closely related to this tumor will be given.

The patient fell August, 1915, from the staircase, striking his head. Following this he showed some motor disturbance of the upper extremities which improved in a few days. At this time, however, the patient seemed to be suffering from mental and physical troubles which later proved to be those of general paralysis. The general condition became gradually worse and at one time, August, 1917, he showed clonic epileptiform convulsions in the left half of the body. In November, 1917, he had another attack of apparently the same nature. Shortly after this he developed bronchopneumonia and died. The duration of the mental disease covered two years and three months.

The important anatomical diagnoses were: chronic hemorrhagic pseudomembranous internal pachymeningitis, milkiness of the pia mater, universal atrophy of cerebral convolutions, external hydrocephalus, internal hydrocephalus, anomaly of the left calcarine fissure, etc.

Microscopically the characteristic alterations of general paralysis were shown. In addition to these an anomaly of the course of the pyramidal tract was disclosed.

DESCRIPTION OF THE CAVERNOUS HEMANGIOMA AND THE SURROUNDING TISSUE

The tumor, here reported, was found accidentally in the rostrum of the corpus callosum when the hemispheres were separated by sagittal incision. It was located mainly in the rostrum extending anteriorly and inferiorly to the medullary substance of the left gyrus subcallosus, posteriorly to the origin of the septum pellucidum,

dextrally 1 cm. over the midline of the corpus callosum and sinistrally to the border of the left lateral ventricle and corpus striatum. It measured $1.4 \times 0.9 \times 0.8$ cm. The tumor was dark brown in color and the surrounding brain tissue showed a like discoloration. Even by macroscopical observation the cut surface was shown displaying a cavernous structure with thin-walled septi. There were a few tiny spots which were grayish-white in color, suggesting an organization of the parts of the tumor.

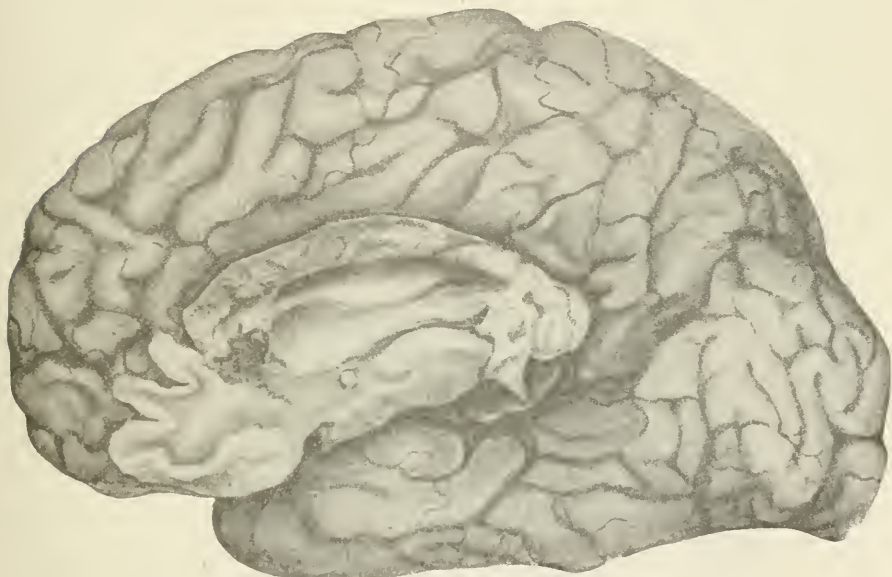


FIG. 1. Cavernous hemangioma occupying the rostrum of the corpus callosum.

Pieces were taken from several parts of the tumor. One half of the blocks were cut by frozen section method, and the other half by embedding in paraffin. The former stained by Sudan III, Bielschowsky's silver impregnation method; Weigart Pal's myelin sheath method, Weigart's glia method, Kossa's method for demonstration of calcium, iron reaction, etc. The latter were stained by hematoxylin and eosin, and van Gieson's method.

Important findings will be described according to the different methods of staining.

1. *Hematoxylin-eosin Method*

The tumor was composed of intercommunicating, irregularly shaped larger and smaller, blood spaces lined with endothelium and surrounded by connective tissue. Most of these vascular spaces

contained blood corpuscles, while some of them were occluded by organized tissue. The surrounding fibrous tissue was shown to be genuine connective tissue and not of glial nature. The thickness of these surrounding fibers was variable; in the upper and posterior part it was considerably thick and dense, while in other parts less dense and in the lower and anterior part, particularly, there was no fibrous tissue intervening between the brain substance and the tumor. In the neighboring brain tissue of this lower and anterior part, blood spaces of various size and form were seen scattered about without any surrounding connective tissue. These spaces were proved to be communicating with each other, when studied by serial section method. The brain tissue surrounding the tumor showed a great number of fat corpuscle cells which were distributed diffusely and more particularly accumulated around the blood vessels. It was noted particularly that the pigment substance of these fat corpuscle cells was brownish in color in the direct neighborhood of the tumor, while it was more dark in the remote parts.

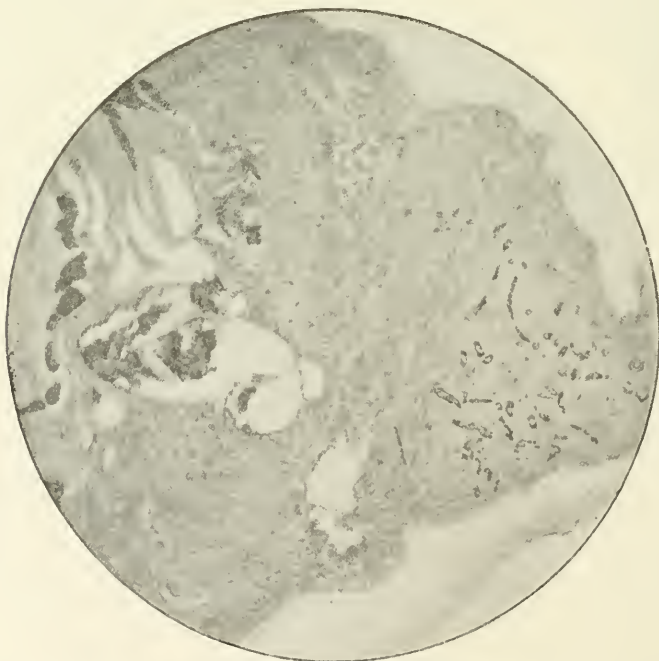


FIG. 2. Peripheral part of the hemangioma showing calcified vessels of the neighboring brain tissue.

Some of the blood spaces were surrounded by more or less numerous lymphocytes and plasma cells. Large round cells with mul-

tiform nuclei were shown in linear arrangement in the brain tissue bordering the posterior portion of the tumor. From these cells fibers were radiating toward the tumor. Between these fibers a large number of cells of various forms and sizes were observed.

The whole picture thus resembled a connective tissue and granulation process.

The large cells in linear arrangement, however, when studied carefully, were shown to be invading ependyma cells and the fibers were also proved to be of glial nature produced from ependyma cells. The ependyma cells, as is known, differ from spider cells, in that they do not give off their prolongations in every direction but only toward one direction. The numerous cells of various forms, mentioned above were also nothing but proliferating glia cells. The brain substance at the posterior part of the tumor, thus, showed a marked reactive hyperplasia of the glial elements.

In the cerebral substance at the superior part of the tumor a fibrous or homogenous tissue which contained some osteoblastic cells came to view and was considered to be osteoid tissue. This suggested a fairly old process in this part of the tumor.

In general, capillaries were increased in the surrounding tissue of the tumor. These showed, as is illustrated in the accompanying figure, a great tendency to calcareous deposits on their walls. Some of these capillaries were seen containing blood corpuscles, while others did not show any cellular content and appeared to be occluded.

2. *Weigert Pal's Myelin Sheaths Method*

The myelin sheaths were not demonstrated in the immediate neighborhood of the tumor. There was diffuse pallor of the medullary substance in general due to an advanced paralytic alteration of the cortex. However, the degeneration of myelin sheaths here observed was more marked and focal in character and was naturally to be interpreted as a result of the destruction caused by the tumor, either by direct pressure or by indirect nutritional disturbance.

3. *Weigert's Neuroglia Fiber Method*

Glia fibers had proliferated and surrounded the tumor, forming a considerably thick wall which, however, was irregular in its thickness and density. At the superior and posterior part the glia fibers were finer and their network more dense, while at the inferior and anterior part the opposite condition was maintained. The glia cells at the latter part presented a large protoplasmic cell body with coarse

prolongations. These all indicated that the reactive process of the glia was fairly old at the superior and posterior part, while it was rather new at the inferior and anterior part.

The glia fibers were demonstrated not only around the tumor, but also invading into the interspace of the cavernous structure, in this respect differing especially from previous descriptions of various authors.

4. *Sudan III Staining*

Fat corpuscle cells were fairly abundant in the surrounding brain tissue but particularly numerous at the anterior and inferior part of the tumor, suggesting a recent process of cerebral destruction. The fat corpuscle cells were shown carrying an iron pigment, occupying not only the immediate neighborhood of the tumor but also the perivascular space of fairly remote vessels.

5. *Iron Reaction and Kossa's Calcium Staining Method*

The surrounding tissue of the tumor exhibited a diffuse iron reaction. The pigment substance carried by the fat corpuscle cells displayed also the iron reaction. In the capillary walls which were shown impregnated with calcarious deposits, the iron reaction was also present.

By the Kossa's staining the calcium salt was not observed in either cavernous walls or in the brain tissue immediately surrounding, but was found in the vessel walls which were fairly distant from this growth. The calcium deposition, therefore, seemed to take place where the vessels were loaded primarily with iron pigment, by means of the scavenger cells—fat corpuscle cells, glia cells, etc.

SUMMARY

Astwazaturow learned from the literature that more cases of women have been reported than those of men, *i.e.*, eight women versus three men. Consequently the author came to the conclusion that there is a certain predisposition of women for the development of this tumor. Two cases, afterwards reported respectively by Sweasey-Powers and Lewandowsky were also women. A case described by Oppenheim and the writer's case were both men and although the statistics show a majority of women it can not necessarily be considered that women have a greater predisposition than men. As mentioned above in the introduction, the reported cases of this tumor are relatively few, compared with those really existing, because of the difficulty in diagnosis, and consequently the few

opportunities for dissection. Therefore it seems hardly justifiable to draw conclusions from a few cases which might prove to be a very small portion of the existing cases. Moreover, if trauma is the etiological factor in the production of these tumors more cases of men would naturally be reported than of women. The question is, therefore, to be settled after studying a greater number of cases.

What is the etiology of the tumor? Is trauma, as claimed, associated with the genesis of the tumor? In this case there was a history of a head trauma with following paresis. This paresis lasted for a few days only, and there were no scars, evidences of fracture or deformities remaining. Post-mortem examination did not reveal any perceptible residue of the early trauma. The osteoid tissue found in the surrounding brain substance, on the other hand, pointed to an old reactive process which apparently had begun at an earlier date than the history of the trauma. We have, therefore, at least in this case no definite evidence which speaks for the traumatic theory.

Before going into further discussion, it will be found convenient to review the representative opinions of the authors concerning the genesis of cavernous hemangioma in general.

According to Virchow, cavernous hemangioma of the liver is a genuine neoplasm. The process begins with abnormal growth of the interstitial connective tissue and the destruction of the parenchyma. Then the vessels in the proliferated connective tissue execute secondary new formation and dilatation. These vessels intercommunicating with one another form, finally, a characteristic cavernous hemangioma.

Schmieden and Albrecht, on the other hand, do not regard this as a neoplasm, but claim that it is anomalous tissue due to developmental disturbance. These tumors remain, therefore, the same size throughout life and do not show a tendency to proliferation.

The genesis of this tumor in the brain, however, is differently explained by some authors. Here the congestion of the vessels by some cause or other is considered to be the primary factor. The dilatation and proliferation following this result in the formation of a characteristic tumor.

Some others consider that the plexus of the vessels, which later turns into a tumor, is formed secondarily from a part of an organized hemorrhagic focus.

Astwazaturow holds the same opinion with Virchow as to the modus of formation of the tumor. The connective tissue is, according to this author, derived from the pia mater, and we find as a

matter of fact that the tumors were in most cases situated in the neighborhood of the pial lining.

To which of these theories does our present case agree? Let us first inspect the location of the tumor and the relationship, if any, with the pia mater. The tumor was located, as described above, for the most part on the corpus callosum; the anterior part extending into the white substance of the gyrus subcallosus; the posterior part to the origin of the septum pellucidum. This tumor is therefore placed in the deeper part of the cerebrum neighboring on the lateral ventricle. The pia mater is found in the lateral ventricle as a plexus choroideus posterior to the foramen of Monroe and not in the anterior horn. The tumor has thus no direct relationship either with the pia mater of the cerebral surface or with the plexus choroideus found in the ventricle. The cases of Luschka, Engelhart, Bruns, and Sweasey-Powers showed also no direct connection between the pia mater and the tumors, which were seated in the deeper part of the brain substance. Thus the pial origin of the tumor is not proved.

Next comes the question of the hemorrhagic origin. The brain surrounding the cavernous hemangioma displayed a diffuse iron reaction suggesting the destruction of the extravasated red blood corpuscles. Excepting this iron reaction, however, this case presented no indication of cerebral hemorrhage. The iron reaction can be regarded more reasonably as a secondary hemorrhage "per diapedesin," due to the congestion and dilatation of the blood spaces. So this theory is not consistent.

Finally we have to consider the congenital or embryonic factor in the development of the tumor.

Although there was nothing ascertained which speaks directly for the congenital nature of this tumor, there were some evidences of it. There were malformations, such as well-marked asymmetry of the calcarine fissure, anomaly of the course of the pyramidal tract, invasion of the ependyma cells into the white substance of the gyrus subcallosus. If we summarize all these findings it is quite probable and reasonable to conclude that the tumor was of a congenital nature. Oppenheim claims that the patients having this tumor are apt to show some malformations in the realm of the circulatory system. The present case did not show any malformations in the circulatory system but it did show some in the central nervous system. Admitting that this tumor was most probably of congenital origin, it is rather a difficult question to answer as to whether it is, as Schmieden stated, only a malformed tissue which does not

proliferate, or, as Sweasey-Powers proposed, a neoplasm developing from a misplaced embryonic tissue. The writer intended to find, applying various staining methods, the time element in the reactive processes of different parts of the surrounding brain tissue. The hematoxylin-eosin method revealed an osteoid tissue in the superior and posterior part, where by Weigert method, neuroglia fibers were shown finer and denser than those at the inferior and anterior part. By Kossa's method calcareous deposits were more markedly demonstrated at the superior and posterior part than at the inferior and anterior part, while by Sudan III method the opposite condition ruled in its distribution.

All these findings indicate that the process was at the superior and posterior part fairly old, while it was relatively fresh at the inferior and anterior part.

Not only the neighboring brain tissue but also the tumor itself, when examined carefully showed a considerable difference in different parts. In the upper part the blood spaces were larger in caliber, and the tumor of this part surrounded by a thick connective tissue, while in the lower and anterior part the spaces were finer, their walls were thinner and the blood spaces were seen infiltrating into the brain tissue and communicating with one another.

The findings in the tumor itself as well as the surrounding tissue, show that the tumor was a growing one and was progressing downward and forward into the white matter of the gyrus subcallosus. The neuroglia fibers found inside of this tumor may also explain the progressing nature of this tumor. These fibers may possibly be ones that had proliferated around the tumor and were later taken into the structure during the course of the new formation.

Finally the writer has to add something to the symptomatology of this tumor. The absence of pressure symptoms was regarded as one of the characteristics of this tumor. When the elasticity of the tumor is lost, either by organization or by hemorrhage, it begins to show for the first time tumor symptoms.

According to Astwazaturow, the epileptic symptoms shown by some of the reported cases are said to be due to temporal lobe invasion. Where epileptic convulsions are found, and also tumors located in parts of the brain other than the temporal lobes, it may be concluded that the epilepsy is primary while the tumor is secondarily developed on a traumatic basis. The epileptiform convulsions shown in the final stage of our case were probably of paralytic nature and not manifestations of the tumor.

However, speaking in general, it is quite possible for this tumor

to cause epileptiform convulsions, because the tumor is progressing in nature and a considerable proliferation of neuroglia fibers is to be expected.

CONCLUSION

1. The writer presents a typical cavernous hemangioma of the brain which did not show any clinical symptoms.
2. The tumor has no direct developmental relationship with the pia mater.
3. There is no definite indication that the tumor resulted from a trauma.
4. Neither primary congestion nor hemorrhage seems to play a part in the formation of this tumor.
5. The writer advances the congenital theory of this tumor because of the presence of other congenital structures in the central nervous system of the same person.
6. The tumor is progressive in nature which is shown by the reactive changes of the surrounding tissue.

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PSYCHIATRY BEFORE HYPOCRATES*

BY JONATHAN WRIGHT, M.D.

II. THE PSYCHIATRY OF THE GREEKS BEFORE HIPPOCRATES

There is no passage more often quoted from the Hippocratic writings than that in which epilepsy, or the "sacred disease," is declared to be no more due to the intervention of the supernatural powers than any other disease. The vehemence with which Hippocrates attacks the evidently large class of physicians in his day, who threw thus on the gods the responsibility for their own failures in therapy and diagnosis, is a plain indication of the existence of a large body of belief, both lay and professional, which looked upon nervous and mental disorders as especially of divine origin. This is primitive belief and still lingers most easily recognized in modern oriental life. From the ancient oriental civilizations however we get a scanty gleaning in the records left us, as has been seen, but we get some hint of oriental neuroses when we read the pages of Herodotus.¹²

It is now commonly recognized that the Father of History is usually to be relied on when we are sure he speaks of things coming under his own observation and when he relies on the deductions he makes from circumstantial evidence his statements are not to be despised, but being deeply religious himself, he is plainly too often the dupe of a priesthood who were adepts in the art of mendacity. One of the first reports of insanity we find in Greek literature is the account he gives of Cambyses, the son of Cyrus the Great. It is often possible to note in history that great kings have appeared after thorough preparations have been made for them by their great fathers or predecessors on the throne. A host of names arise in the mind. Philip of Macedon, Frederick William of Prussia were the fathers of Alexander and Frederick the Great, Richelieu and Mazarin prepared the way for Louis who "wrote The Great before his name." But even discounting the chance they were given in the world at the start, they had their merits and knew how to use

* Continued from August, 1920, issue.

¹² Herodotus, *The Histories* of, translated by Cary (for the text see Teubner, ed. by H. Kallenberg).

what was provided for them. The empire of Cyrus the King of Kings extended from the Ganges to the Bosphorus, from the eastern steppes of Asia to the balmy Mediterranean. Cambyses, his son, may indeed have been an epileptic from his infancy, as Herodotus declares (III. 30) he had heard, but perhaps it was the kind of epilepsy Caesar had or perhaps such fits as affected the mighty modern conqueror on whom the pyramids "looked down after forty centuries." Perhaps the kind of fits Grant's whiskey caused were the kind that the Egyptian priests had in mind after Cambyses made them crawl in the dust on their bellies before him. A century or so afterwards they told Herodotus what they thought of Cambyses and it can hardly be accepted as historical criticism. He who had led a huge army through the Arabian desert and overthrew the power of the Pharoahs, where no longer a Pharoah from the people but one from the priests reigned, was forsooth a crazy man. He who was overwhelmed by the sands and the dearth of the desert as his modern representative, the Great Napoleon, was by the snows of Russia, he whose army starved in the desert on the way to Abyssinia and the oasis where Ammon had his altar, just as some of the British battalions have done since, may have indeed seemed mad to the luxurious priestly temple dwellers in a land of milk and honey. When he stabbed the holy Apis in the thigh they knew it.

As he had fought the power of the magi in Persia so he fought the power of the priests in Egypt. When Cambyses skinned an unjust judge and sat the son on his father's hide to judge more justly he appealed more to future millenniums than to the sympathy of the priests of Amasis in his time. Why they should have thought him mad or impious to marry his sisters does not appear. That was orthodox African doctrine. We may suspect he was bidding for Egyptian votes then and when he stabbed the holy bull of Apis he was notifying the Persian magi he was no backslider in the religion of Zoroaster. Perhaps such touch of madness as he gave to his fame is to be accounted for by his necessity for assuring the wild tribes over which he ruled that he was the agent of God, whose plans are past understanding. Of all these things we read in Herodotus and across the record we see written ancient oriental statecraft and the priest-craft of the cloister and above all we see the awed credulity of the early Greek. The Athenian of the time of Aristophanes would never have swallowed as gospel what the priests told Herodotus. At any rate a degenerate epileptic is not found in the stuff Cambyses was made of. We get a hint

from another source of the unsatisfactory nature of the religious and educational state of Egypt as it was found by the Persians. A record has been found¹³ of a commissioner, Darius, the Great, successor of Cambyses, sent to Egypt to inquire into the conditions of its schools and to work a reform in the exceedingly bad state of things he found there and which he embodied in the report he sent to the Persian king. This document, taken in its relationship to the gossip Herodotus, who was born (484 B.C.) the year after Darius died, heard throws quite a light on the trouble Cambyses had made for the priests and the animosity he had inspired in them. Cambyses had come from the far uplands of Persia and conquered their land and when his successor Darius put their schools in order for them, as a much more recent conqueror did for their southern territory, the Egyptians doubtless came to the opinion regarding the Persians which Kipling says they entertained of Kitchener and the British.

"For Allah created the English mad, the maddest of all mankind . . .
They terribly carpet the earth with dead, and before their cannon cool,
They walk unarmed by twos and threes to call the living to school."

While the hand of Darius still lay heavily upon them they doubtless gave heed to the advice:

"Go and carry your shoes in your hand and bow your head on your breast," but when the Persian power in its turn was abated they put their own interpretation for Herodotus on the performances of Cambyses.

There is an account of another madman in the histories of Herodotus. The story of Cleomenes is a very different thing from that of Cambyses. He was king of Sparta. It is not the hero of Plutarch, but an earlier King Cleomenes, who was a warrior and a politician of no mean ability, of whom Herodotus speaks (VI. 75). His was a frank case of insanity, of "maniacal disease," indeed. They brought him back from his conquests and his disasters to Sparta and his relatives put him into wooden fetters, but he got hold of a knife and performed hari-kari on himself, with many preliminary gashes and slashes on his body, "and in this manner he died." Herodotus tells the story in such a matter of fact way, almost without comment, just as though suicidal mania was no unknown incident in private life but worthy of mention in a king concerned with great affairs, that we are forced to think of it in that way.

¹³ Schaeffer, Heinrich. Die Wiedereinrichtung einer Arzteschule in Sais unter König Darius I, *Zeitschrift für Aegyptische Sprache und Alterthumskunde*, vol. 37, p. 72, 1899.

We have got fairly into a stage of society, comparatively highly evolved, when at least a king could be really insane and live and have a correct medical diagnosis made in his case. It may well have been a little different in the time of Homer. Herodotus said Homer lived 400 years before his time and on going over the *Iliad* one perceives that he was at least very little interested in the phenomena of nervous disease, but as to the *Iliad* one may say that of disease in general. It was the story of adventure by land and by sea that the Homers of the litoral of Asia Minor and their audiences were interested in and we can do no more than search the immortal lines for some incidental dropping of a phrase that will illuminate the dark point with which we are concerned. In the *Iliad* I am able only to bring forward one clause as evidence of the existence of mental disease, though of course I cannot venture to deny that those who are more learned and fortunate than I am may sometimes make a richer haul. In Book XII (l. 234) Hector is vigorously reproofing his brother Polydamas. "If thou art in earnest then the gods themselves have utterly destroyed thy wits," the translators¹⁴ render it. Hector's anger we see is expressed in conventional wise. We should perhaps be quite as impolite and more profane. We have no right to see the thought any more closely associated with divine visitation than in our own most profane colloquialism but we do see that some men were thought to be crazy in Homer's day. In the use of the Greek word *φρένας* we also observe¹⁵ that the wits dwelt around the diaphragm. So in the *Odyssey* (XVIII, 327) we get the same word applied to the disguised hero by one of his lecherous kitchen wenches, telling him he is drunk or worse, crazy even, since a man may perhaps cease to be a fool when no longer drunk. We know the modern jibe. This is all we get in direct reference to "phrensy" either in the *Iliad* or in the *Odyssey*, so far as I can observe. Perhaps this paucity of reference to insanity has in itself a significance, though we may well look on negative evidence with suspicion. There is little need in the technique of the epic poet for the employment of insanity to fix the interest of the listeners upon the verse which rhapsodes wandering from one fireside to the other chanted. In history we have seen it mentioned, at least once unmistakably. From such sources we gain little for our chronology of the growth of the

¹⁴ The *Iliad* of Homer, done into English prose by Lang, Leaf and Myers, 1915.

¹⁵ The *Odyssey* of Homer, done into English prose by Butcher and Lang, 1906; for the texts see *Homeri Opera*. Monro and Allen, Oxon. 1908.

rational as opposed to the mystical conception of insanity. Whatever may have existed in those poems of the Homeric cycle, which have not been transmitted to us, in the Iliad and the Odyssey we find Ajax Telamonides and Orestes without a trace of madness; but in post-Homeric legend around their names are clustered the dramatic conceptions of humanity with which Macaulay's school-boy was familiar and of which even we have heard.

In the Greek tragedies we may see this dramatic *motif* apparently grafted on those of an epic tale. It was the drama of a much later age than that of Homer which had use for an insane Ajax and a mad Orestes just as a still much later tragic stage had use for an Ophelia and a King Lear, even for the fake madness of a Hamlet. The Greek dramatists had to exhibit a more primitive conception of insanity than Shakespeare. Their audiences were in sympathy with one which the Elizabethan pit would have deemed strange, but in the story of Cleomenes as told by Herodotus we get a plain unvarnished tale which there is no mistaking. In the story of Cambyses his reverence for religion in accepting the mystical interpretations of the Egyptian priests led him, we are fain to believe, away from the path of historic truth. The dates given for the life span of Æschylus (525-456 B.C.) are more than two hundred years after that ever attributed to the latest of the poems of the Homeric Cycle. He gained his first prize in 495 B.C., almost ten years before the birth of Herodotus (484 B.C.) and just ten years before the birth of Euripides (485 B.C.). We should therefore naturally expect to find that the thought of Æschylus approximates that of Homer more nearly than that of the later dramatists. Indeed the elder poet declared that he lived on the crumbs that fell from Homer's table.

In Æschylus'¹⁶ Prometheus we find Io stung to madness by the gadfly, but in this play no more than in the Choephoroe and the Eumenides do we get any objective portrayal of insanity. In Sophocles'¹⁷ indeed there are the mad actions of Ajax described, but very badly described from the standpoint of objective reality, and this criticism is only a little less justified for the madness of Orestes in the Iphigenia of Euripides. In the case of Æschylus this is almost as disconcerting an observation to venture as it would be to cavil at the lack of realism in the lines of Homer. We might confi-

¹⁶ The plays of Æschylus, translated by Walter Headlam and C. E. S. Headlam, London, Bell, 1909 (see the texts of Wecklein and of Verrall).

¹⁷ Sophocles. The Ajax: In his plays and fragments translated by R. C. Jebb, Cambridge University Press, 1894.

dently expect to find in the Greek tragedy a more profuse resort to this part of dramatic composition and we do find a more extended field for study, but even this fails to remove the impression left on our minds from a consideration of the Homeric poems that, aside from the words and ideas associated in our minds with hysteria or mania, there are very few suggestions indeed of aberration of the mind. Perhaps there are more than I have been able to find, but at best we get no direct reference to insanity in Homer and scarcely any indirect or incidental expression of the prevalence of chronic mental derangement or marked mental weakness. This being forced upon our attention, we have to suppose that such phenomena were exceedingly rare or placed in other categories in the environment of Homeric authorship as in that of primitive men. If we eliminate from the group, as having at once perished, those dangerous to individuals or to society or obnoxious only, if we omit to number those perishing from their own inability to meet the demands of a primitive civilization owing to mere weakness of intellect and if we place the hysterics or hysteroids and mildly deranged among the inspired prophets, priestesses, Bacchantes, we have removed large numbers from those likely to be recognized in ancient nosology as deranged in mind. We may say therefore that before the time of Æschylus little or no advance had been made in the differentiation of mental affections among the Greeks on a purely rational basis. Indeed we may well apprehend from the testimony offered in the Hippocratic writings that it had hardly begun even in the fifth century B.C.

In one or two plays of Æschylus however we get indications that even the madness inflicted by the Furies is a blight of the mind though the ruin of the intellect is a disaster still seated in the thorax rather than in the brain. This perhaps is better realized in the original by those competent to judge of the passage in the *Eumenides* (l. 343-5) but it must suffice here to use the translation of Headlam.¹⁶ "Over the victim is chanted this ditty, to madden the brain, distract the sense, and blight the mind, a hymn that from the furies comes, fettering the will, untuned with harp, and withering men away." This differs from the thought of an inspiration from the gods manifested in the incoherent words of a mad priest, but those even superficially acquainted with the trend of thought in the primitive mind will perceive it here. They will see reference to the belief in the effect of music on the aberrations of the mind and the prominence given to it by primitive men. They will also perceive

the intervention of the supernatural in the cause of mental disease, just as in all disease at a still more primitive stage we always discover it in the study of the medical thought of primitive men. We see the gods causing madness it is true, but it is an aberration of the mind not an inspiration at all. In the Prometheus (l. 394) it is not only a disease of the will but also the use of curative words by mortal medical men that plays a part in the thought. Oceanus asks:

"Knowest thou not then, Prometheus, what is said, that words are the physicians of a mood distempered?"

The application is not directly made to insanity but the indirect implication of the thought is plain, though still primitive insofar that it suggests incantation on the part of the attending physician. It has however here a rational turn which it is well to take note of, since the purely primitive idea is that God not only causes disease but cures it. We get the brain sickness changed here etymologically in such a way that we might translate it rage as the word is used in Homer, and this is still further suggested by a similar use of it further on (ll. 1009-1010), but when we read in the same play of the madness of Io, the association of words and ideas is such that we get a mania in a young female which is of an entirely different type. The divine interference is by means of a gad-fly. Objectionable as this is from a viewpoint of rational etiology it gives us a clue that connects us with hysteria as a sexual factor in the etiology. She is fleeing from the embraces of a lustful god but the trouble is in the thorax and her heart, in the words of Headlam, is "kicking at her ribs."

I am aware on how slender a reed I am leaning in seeing here any real differentiation of madness in the mind of the poet, but it is quite possible to advance a plausible reason for believing that not only Herodotus but the tragic dramatists had a juster appreciation of the causes and the varieties of mental aberration, than the common people. This we may readily infer from other reasons on general grounds, but in the drama and indeed in any literature which appeals to the generality of men we readily understand that the author must speak in terms entirely in consonance with the ideas and emotions of his audience. Vastly more widely diffused and much more deeply rooted in the populace of the day were the primitive ideas with which modern ethnology has made us familiar. Owing to the false theory of the etiology of insanity entertained by primitive man the audience that faced the ancient stage of Greek tragedy was looking for something, which is unnatural and wide

of realistic truth, in those stricken mad by the wrath of God. In the time of Æschylus, much less in that of Homer, they would not have recognized the more artistic realism of a Lear or an Ophelia. Modern alienists are perhaps, from a scientific point of view, by no means satisfied even with these, but if they will turn to that of Ajax in the tragedy of Sophocles and that of Orestes in the *Choephore* of Æschylus it will not be difficult to mark the advance of the conceptions of the audience to which Shakespeare appealed over that which listened to the tragedies of Æschylus or to the lays of Homer. At least in the later Greek tragedians the evidence is clear that they had a knowledge of insanity in accord with the opinion of Hippocrates as to the Sacred Disease. Homer indeed would have little reason for entertaining his circle with an account of the madness of Ajax but it doubtless was not only the instinct of the artist in Æschylus which prevented him from portraying something false to nature to suit the theories of his audience. Either from the conventionalism of the Greek stage or from the reason I have suggested he refrains from introducing the real ravings of Orestes in the *Eumenides*.

We might be allowed to imagine this likewise of the Ajax of Sophocles. The madness of the latter is told at second hand and the picture is very much lacking in reality, though on the stage is shown the results of it,—the sheep and other cattle lying there with their throats cut by Ajax who took them for his enemies, the *Atreidæ* and their followers. In violating the traditions of the actions of the gods both Æschylus and Sophocles well knew what their impiety might cost them, their lives perhaps. Euripides was some twenty-five years older than Hippocrates, and he came fully to experience the bitterness which comes from revealing to the multitude the truth for which they are unprepared. Nevertheless even in the much older Æschylus we see evidence of some departure from the belief of primitive men as to the nature of insanity. It was one of the antecedents to the boldness with which Hippocrates declared that the sacred disease was no more sacred than other diseases. Æschylus may have himself had no share in the superstitions of the multitude, but he had a very acute sense of the deep underlying roots of ancient belief. The Furies in his day already belonged to an ancient theogony. In the *Eumenides* one of them says: "I have a grant of antique privilege nor do I meet with any lack of honor." We understand then the source of it in the previous demand: "Where then is the mortal that boweth not in awe and

terror of these things?" We get his psychoanalysis in a previous line: "And while he falleth, yet doth a man know it not, from the disease of folly." He may not have been as ready to go as far as Hippocrates in his time and assert it is a disease like any other. Indeed I do not know that even now psychiatrists feel ready to go that far.

However that may be we recognize in the Eumenides the modern touch in the speech which falls from the divine lips of Jove's daughter at that immortal trial on the Areopagus, in which is condensed as much of human wisdom as has ever been garnered in any Mount of Sinai or of Olives. Athena declares: "It is the offenses of his forefathers that arrest and hale him (Orestes) before these (Furies) and destruction silently, for all his vaunt, crumbles him to dust." Whether we are ready to call it sin or not we recognize the thought of the hereditary taint of insanity and we need not stop to inquire of Æschylus any more than of Moses what brand of sin it was is visited on the later generations. Man in his anguish at any rate finds little comfort in laying at the doors of his ancestry the sins he has committed himself, but for others we recognize in our innumerable charitable institutions and in our altruistic tendencies the touch of that Divine Compassion vouchsafed also to the audience of that trial on the Areopagus in the pardon of Apollo. In our day we have gone the old gods one better. We have absolved, not alone with words, the criminal, whether criminal from heredity or from his environment, but we have housed him and clothed him and fed him and kept him from harm, instead of stoning him to death. I imagine we see the germ of this tendency in the drift of the ancient thought in that grim statement of cosmic law on the Areopagus. There was the statement of the nature of the disease, a statement too of the law. The pardon of Apollo was further evolved on the Mount of Olives and the law was expiated without the intervention of Apollo on Calvary. These are old tales not now fashionable in medicine but I may be pardoned for momentarily shadowing forth what some may think are rather nebulous strands which bind one order of thought to the other.

To make no break of continuity in the development of these I may pass over the *Electra* and the *Ajax* of Sophocles. They add little or nothing, except in technical finish, to the drama of madness, but in the plays of Euripides¹⁸ less artistic perhaps than those of

¹⁸ Euripides, *The Iphigenia in Tauris*; *The Electra*, translated into rhyming verse by Gilbert Murray; *Herakles*, translated by Robert Browning in *Aristophanes' Apology*. For the text of Euripides and the controlling of translations see edition of Arthur S. Way, London, Heinemann, 1912.

Sophocles, less powerful and perhaps less profound than those of Æschylus, we get that evolution of protest against the decrees of the mystery of evil which we see sketched in the pardon of Apollo, that has led to religious apostasy in every age and in every civilization. In the *Electra* of the younger poet we get the note of the iconoclast and the rebel. The blood of Clytemnestra, shed by her son, and his madness now unequivocally lies at the door of God.

"On Apollo's head we lay
The blood doings of this day."

This we see is the sequence to the thought of Æschylus which Euripides echoes evidently in reminiscence of the earlier play

"One stain
From dim forefathers on the twain
Lighting has sapped your hearts as sand."

But he makes no bones of it. The whole business is the doing of the gods, quite as incomprehensible as are the phenomena of heredity still to us. It is up to them to wash away the stains of sin and insanity,—with sheeps' blood if they must acknowledge that human sacrifice is out of date,—if there are to be "no more wars to cure wars"—we say in our uneasy thinking of such problems. I imagine this puts us right on the track of modern thought. We have swept away the gods and Society must now step into Apollo's place and assume the responsibility, responsibility not alone for society's environmental sins, but for hereditary crime and insanity, the ancient crime of the gods, as charged by Euripides. In the play of Æschylus we can imagine modern society at the bar of the grim judge on the Areopagus. Our improved jails and our improving insane asylums we exhibit to her in answer to her demand, "What are you going to do about it?" "These take the place of the Atreidæ blood feud," we say. "But what of their hereditary taint?" "Well," our genetic counsel offers, "we are looking after our degenerates among the poor . . . to see they don't breed." The laughter of the gods rolls down the vault of heaven. "The Atreidæ belong among the kings of men and they are breeding among you as of old and as of old you are too cowardly to lay hands on them though you are thinking of castration for the poor. You pocket the gold of the Atreidæ for your altruisms and you turn your eyes away from their couches. No visiting district nurse, asking impertinent questions, forces their doors."

Euripides found how bitter the life of the reformer could be made who was too much of a reformer. With the life span of Euripides we have entered into the times of Hippocrates.

LETHARGIC ENCEPHALITIS

A REPORT OF TWO CASES, WITH THE ISOLATION OF A STREPTOCOCCUS
FROM THE BLOOD OF ONE CASE

BY JACOB MEYER, M.S., M.D.

ASSOCIATE IN MEDICINE, MT. SINAI HOSPITAL, CHICAGO

The term encephalitis lethargica was first applied by Von Economo¹ to a number of cases which appeared in Vienna in 1917. The chief clinical characteristics of this disease were lethargy, associated with cranial nerve involvement, manifested by ocular or facial palsy, and fever. Von Economo refers to a similar epidemic disease which occurred in 1712 and 1891, following pandemics of influenza. Numerous other writers have reviewed the literature showing the association of a "sleeping sickness" following pandemics of influenza, and it is not necessary to repeat this here. It may be mentioned that the disease was known as *nona* in Italy following the epidemic of influenza in 1890-91.

Following the observations of Von Economo in 1917, the disease was noted in France and England in the early part of 1918, while Pothier,² Neal,³ and Bassoe⁴ were the first to report this disease in this country in 1919. Numerous reports have appeared since then in the literature.

The recurrence in the past months of an epidemic of influenza in certain sections of this country, and particularly in Chicago, lends interest to the report of the present cases.

CASE 1.—A. L., aged nineteen, girl, stenographer, was seen for the first time February 3, 1920. The history obtained was rather meager. The patient was sick for about two weeks, during which time she complained of fever, chilliness, backache, and cough. She was a well nourished girl, feverish and toxic. The physical findings in the chest were negative. The temperature was 102, respiration 26, and pulse 122. No attention was paid to the reflexes except that the patellar reflexes were absent. The patient was seen again the next morning. On entering I asked how she felt and the response was slow, but she answered, "All right." On asking her other questions, I noticed a facial asymmetry, the furrow on the left

side of the face being rather distinct, while that on the right was absent. On the previous day, I had asked the patient to cough, but she whistled instead. I asked her to whistle again, which she did, but she could not say the words "five," "fifteen," or "four." In spite of the drowsiness, which was striking, she was easily aroused, and seemed to be aware of what was going on about her. A tremor of the fingers and a slight degree of rigidity of the neck was also noted. There were no ocular findings. The patient was removed to the Mt. Sinai Hospital. A spinal puncture was made on admission, the patient reacting only slightly during the puncture and scarcely realizing what was being done.

The spinal fluid was under moderately increased pressure, clear, and globulin was also present. There were 48 cells per cmm., the majority of which were lymphocytes. Cultures of the spinal fluid were made on aerobic and anaerobic media.

On February 5 the facial involvement was not as distinct as on previous day. The enunciation was not clear and the voice had a distinct nasal quality. There was no paralysis of the palate, but the uvula was directed to one side. The abdominal reflex was absent. The patient voided urine every half hour, but there was no incontinence. Clear mentally.

Feb. 6. Patient was not as irritable as on the previous day. Speech was somewhat improved. The condition of the reflexes was as follows: Patellar present, Kernig was questioned as positive. Brudzinski, negative. Babinski, negative. An ankle clonus on the left side was obtained but this was transient and was therefore questionable. The pupils were equal, but the reaction to light was slow.

Feb. 7. The appearance of the patient was not unlike that of a case of typhoid fever. The absence of enlargement of the spleen and rose spots ruled out this possibility. A mitral systolic murmur present at the apex was now observed associated with a slight enlargement of the heart to the right. A possible ulcerative endocarditis was ruled out by the absence of petechiæ, the relatively low leucocyte count and absence of chills and fever. A tuberculous meningitis was considered as a possibility, but this was eliminated by the clinical course of the case.

Feb. 8. Patient was extremely irritable and cried at periods, the cry being not unlike that of a child with meningitis. Mentally the patient was very clear. The pupils reacted to light only slightly, and then dilated again. A second spinal puncture at this time revealed a clear spinal fluid, under moderately increased pressure, showing a positive globulin reaction and 26 cells per cmm. Eighty

per cent. of these cells were lymphocytes. Following this puncture the patient became delirious for a short period.

Feb. 9. The facial involvement was very distinct. The pupils did not react to light. There was no ptosis, nystagmus, or photophobia. The other reflexes were as on previous days. A constant coarse tremor of the left arm was present at this time. The patient was clear mentally, but responded only in monosyllables, and was unable to whistle.

Feb. 10. The speech was improved to a slight degree and patient was able to say "sister," "Gertrude," "two," "three." Ophthalmoscopic examination by Dr. Lebensohn showed the fundi to be normal.

Feb. 11, 8:30 P.M. Patient suddenly became stuporous and was unable to swallow. Restlessness was also present and was accompanied with movements resembling the polishing of the hands by a manicurist. Ptosis of the left upper eyelid appeared. Urinary and fecal incontinence.

Feb. 12. A paresis of the entire left side with a complete hemianesthesia developed on this day. The Babinski was absent, as was a left ankle clonus, but a right ankle clonus was obtained. An ankle clonus appeared later in the day on the left side. Difficulty in swallowing was also noted at this time. Blood was obtained for culture on this date.

Feb. 13. Rigidity of the neck appeared, the stupor increased, also the respiratory rate, but there was no evidence of any lung involvement. The findings with reference to the reflexes were as previously. The patient had a number of attacks which were characterized chiefly by delirium. These came on in the evening about 8 P.M., were short in duration, associated with wild and uncontrollable movements, rapidity of pulse and profuse sweats.

Feb. 14. The mask-like appearance of the face, so often described, was most apparent on this day. The face was immobile and expressionless. A ptosis of the left upper lid was present. The left side of the face was now smooth. The right upper extremity was rigid and extended with difficulty. The patient was now able to move the left upper and lower extremity about and the anesthesia of the left side had disappeared also, but there was a paresis of the entire right side.

Feb. 15. The paresis on the right was now a complete paralysis, with anesthesia. An ankle clonus on the right was present but no Babinski. The patient's condition was poor. Difficulty in swallowing increased, the temperature and respiration were elevated.

Edema of the lungs was apparently developing. On the 16th the condition was unchanged and on the 17th the patient died. Necropsy was refused.

The leucocyte count on admission was 10,000 per cmm. and daily white counts showed the highest cell count as 16,000 per cmm. A differential count showed 80 per cent. polymorphonuclear leucocytes.

Cultures of the blood and spinal fluid were negative. The spinal fluid was also negative for acid fast bacilli. Blood was examined under dark field, but was negative. The urine was negative, but on the day before patient died sugar appeared.

CASE 2 was seen at the request of Dr. L. Handelman. J. F., aged fourteen, boy, had been sick for five days with an acute infection resembling pneumonia in severity, but which showed no distinct physical signs. On the sixth day of illness Dr. Handelman noticed a facial asymmetry, and a ptosis of the left eyelid, and suspected that he was dealing with a case of lethargic encephalitis. At the time I saw the patient he presented the following: There was a ptosis of the left eyelid and a left facial paralysis. The left pupil was contracted, and responded only slightly to light. The speech was slow, and drawn out. There was no difficulty in expression. The reflexes were normal except that a bilateral ankle clonus was obtained. The patient was clear mentally, and while unquestionably lethargic, he was not stuporous. The temperature at this time was 101. Blood was drawn for culture. Two days later a spinal puncture was made. The spinal fluid was clear, under normal pressure, negative for globulin, 5 cells per cmm. This patient made an uneventful recovery.

From the blood of this patient Dr. R. Tunnicliff and I have obtained a streptococcus, in ascitic fluid tissue media with oil. The same organism was obtained on a blood agar slant to which an excess of the patient's blood was added, the clotted blood probably acting as anaërobic media. In the first generation no growth was obtained by aërobic cultures, but the organism grew aërobically in the second generation. The colonies on blood agar plates are moist, flat, about 1 mm. in diameter. The organism is hemolytic, has a tendency to produce green on blood agar, is not bile soluble, does not ferment inulin and mannite, but does ferment salicin and lactose. Injected intravenously into two rabbits and one guinea pig the organism failed to produce any effect.

Cultures of the spinal fluid from this case were negative.

REMARKS

A review of the literature concerning the etiology of this disease shows that at the present time the exciting cause is unknown. Von Economo¹ considered food poisoning as an etiological factor but ruled it out because of the absence of gastro-intestinal symptoms. He believed that the disease was due to a specific virus resembling but not identical with that which causes poliomyelitis. In England the disease was at first considered as a form of botulism but the work of McIntosh⁵ has disproved this view. It may be remarked that at the present time there have been numerous reports of cases of botulism in this country. While the cases reported are undoubtedly due to *B. botulinus*, it is noteworthy that cases of lethargic encephalitis have prevailed in the community at the same time, and because of the similarity in the clinical manifestations errors in diagnosis are likely to occur.

The late Sir William Osler⁵ and others considered lethargic encephalitis to be a form of poliomyelitis, but the recent studies of the English investigators⁵ would seem to disprove such a view.

Sainton⁶ regards the disease as a result of the localization in the brain of the prevailing influenza, while Bassoe⁴ says that "the etiological relationship of this disease to influenza rests on the coincidence of epidemics of lethargic encephalitis and pandemics of influenza." According to Bassoe⁴ it is not common for patients to have had distinct influenza. He believes that "the encephalitis itself may be a cerebral form of influenza, or it may be caused by a separate virus which in order to become active must have come in contact at one time or other with that of influenza."⁸ Netter regards the disease as a "maladie autonome," the specific agent of which has a special affinity for the nerve centers. Bassoe⁷ and Hassin have suggested that "the similarity between the pathologic changes in African sleeping sickness and epidemic encephalitis suggests a close relationship of the etiologic factors, that is, epidemic encephalitis may be caused by a parasite allied to the trypanosome."

Von Wiessner⁹ found a gram positive diplostreptococcus post mortem in the brain of a monkey in which an encephalitis was produced by the injection of the emulsions of the brain of patients dying of lethargic encephalitis.

Hala and Smith¹⁰ found a gram negative motile bacillus, unidentified but probably belonging to some intermediate class of typhoid enteridites group. The work of Wegeforth and Ayer, J. Neal¹¹ are inconclusive. House¹² found a streptococcus post mortem.

Strauss, Hirschfeld and Loewe¹³ report the presence of a filterable virus in the nasopharyngeal mucous membrane of cases of epidemic lethargic encephalitis, which is capable of producing typical lesions in monkeys and rabbits and have cultivated globular bodies¹⁴ similar in appearance to the organism described by Flexner and Noguchi for poliomyelitis. Our own observation of a streptococcus in one case is another addition, inconclusive but of interest.

Summarizing these views, we may classify them into the following divisions: (*a*) that the disease is due to food poisoning (botulism), which has been disproved; (*b*) that it is a form of poliomyelitis, which has also been disproved; (*c*) that it is due to virus; (*d*) that it is a cerebral form of influenza; (*e*) that it is due to a parasite allied to a trypanosome, and (*f*) that it is due to a microorganism as yet unknown.

The present cases are of interest from a clinical point of view, because a careful review of the literature shows that anesthesia has not occurred in any cases reported. Anesthesia was present in our first patient, and both Dr. Bassoe and Dr. Hassin, who saw this patient in consultation, confirmed its presence. According to the English observers, transitory paralysis, the clearing of a paralysis in one area and its appearance in another region is characteristic of lethargic encephalitis. This was particularly true of our first patient, who first showed a left hemiparesis, which later disappeared only to be followed by a paralysis of the right side. Of still further interest was the early appearance of an ankle clonus opposite the paralyzed side, also the presence of a bilateral ankle clonus and negative Babinski. These findings suggest a diffuse involvement in this case not only of the nuclei at the base, but of the gray matter in the cord.

Attention is also drawn to the attacks of delirium which appeared in both cases. Bassoe described the occurrence of "crises of coarse tremor or choreiform jerking attended with profuse perspirations and weak and rapid pulse"; while the English observers have described attacks of delirium alternating with somnolence. In my cases both delirium and coarse movements were present. McNalty explains the occurrence of delirium in a state of somnolence as attempts of the individual to cerebrated. He is of the opinion that the lethargy is due to the failure of the normal sensory impulses to reach the cerebrum because of involvement of the thalamus. When such an individual attempts to cerebrated in the absence of

normal impulses, the result is incoördinate and manifested by delirium.

104 S. MICHIGAN AVE.,
CHICAGO

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Society Proceedings

THE PHILADELPHIA NEUROLOGICAL SOCIETY

REGULAR MEETING, APRIL 23, 1920

The President, DR. SAMUEL D. INGHAM, in the Chair

MEDIAN NERVE INJURY

N. W. WINKELMAN presented two patients with median nerve injuries. One, a man of eighty years who thirty-five years previously had severely injured the thumb, followed in a few years by numbness of the anterior surfaces of the three external digits, the outer surface of the fourth and numbness about the nails. Pain in the thumb commenced twenty years later. Examination showed abductor and opponens pollicis atrophy with parts of the flexor brevis pollicis atrophy.

A second case of a soldier with shrapnel wounds of the right forearm on radial side below the elbow. There were atrophies as in the preceding case with R.D., shiny skin and curved nails in the median distribution. There were more marked sensory disturbances.

NEURALGIA AFTER EVULSION OF SENSORY TRIGEMINAL ROOT

ANDREW H. WOODS presented a patient who had had a compound mandible fracture seven years previously. In spite of avulsion of the sensory trigeminus root and neurectomy neuralgia had persisted, complicated by an angioneurotic edema of the right half of the lips and right eyelid, with sympathetic palsy of the right eye. The trigeminal cutaneous mucus distribution areas were anesthetic save in the ophthalmic branch. Stimuli caused electric like twinges of pain. Pressure over the right cervical sympathetic produces the pains. Extirpation of the cervical sympathetic or periarterial plexus stripping were suggested as the proper procedures.

Discussion.—S. D. INGHAM brought out his experience with vegetative nerve fiber pain conduction pathways.

HEMIPLEGIA WITH UNUSUAL SPASMODIC MOVEMENTS

C. S. POTTS presented a girl, twelve years of age, in whom a right-sided hemiplegia developed following a scarlatina at the age of five years. Mentally the patient was normal. She was highly emotional and the motor difficulties had increased recently. Neurological status showed a right hemiplegia with tremors. The muscular power was not much inferior to that of the left side. There was a smaller right side. No Babinski. Athetoid movements of the right hand were occasionally observed, and when the patient walked there was an associated flexion of the right arm with grasping of the hair by the left hand. This was accompanied by spasms in the left sternocleido mastoid which shows compensatory hypertrophy. The head was pulled to the right shoulder and backward. On excitement the patient's right arm and leg became rigid and showed clonic contractions. The case was interpreted as one of organic hemiplegia with hysterical exaggeration. The implication of the lenticular region was suggested.

Discussion.—C. K. MILLS emphasized the probable lenticular localization of the lesion. He deprecated operation for the torticollis.

S. D. INGHAM believed that the psychogenic factors were paramount and also denied the utility of operation.

NEW YORK NEUROLOGICAL SOCIETY

THE THREE HUNDRED AND EIGHTY-SECOND REGULAR MEETING,
HELD AT THE ACADEMY OF MEDICINE,
OCTOBER 5, 1920

The President, DR. WALTER TIMME, in the Chair

PRESENTATION OF TWO CASES OF ENCEPHALITIS
LETHARGICA

DR. ISADORE ABRAHAMSON presented an unusual case of encephalitis lethargica for the purpose of showing how intensive study of this disease had shed light upon many obscure points in the pathology of diseases of the mental system. New names were frequently attached to unusual variations of one disease, and discoveries of distinct disease entities heralded without cause. The patient illustrating the complexity of encephalitis manifestations was an Italian, a butcher by trade. His previous personal history was negative. The initial symptoms were pain in the mastoid, then left occiput into left shoulder. There was fever for three days, then a lethargic sleep for two weeks from which he was easily

aroused, answering in a typical fashion. Then movements set in, first in the left shoulder, then in the left index finger. The other hand was soon affected and the speech became markedly involved. It was dysarthric, not aphasic. There was no fine tremor. The legs were involved later. Pains and paresthesia have persisted from the time of the onset nine months ago to the present in the suprascapular region and nape of the neck. The patient complained of formication about the left shoulder. Neurological examination showed the right pupil ovoid up and down, very sluggish to light; accommodation normal. The left pupil was ovoid from side to side, accommodation not so good. Very sluggish to light.

The most marked feature exhibited by this patient was the nature of the movement of the upper extremities, the left especially. The movements were slower than those of chorea, resembled intentional movements, slow, coordinated, asymmetrical, there was no fibrillation, no myoclonia. Every movement of a muscle is followed by movement of a part, both antagonistic and synergic. There is thus presented in this patient, as a late sign of an undoubted lethargic encephalitis, a disturbance of motility, without ataxia, without loss of power, without atrophy, or dysmetria, showing no dysynergy, nor myoclonia. There are evidences of sensory irritation still persisting. The movements are neither choreic nor paramyoclonic, nor do they resemble those of dysynergy cerebellaris. They are not hysterical. They are not the movements of dystonia. There is no torsion spasm of the pelvis or neck. They are extrapyramidal, not induced by pain or paresthesia. It is impossible to designate the affliction by any accurate term belonging in the recognized categories. The accepted classification of disease according to manifestations is here clearly shown to be untenable.

The case presented by DR. THOMAS K. DAVIS was that of a young woman in whom encephalitis had been a complication of pregnancy. The encephalitis began three weeks before the birth of a child in February, 1920, and quite early took the pseudoparkinsonian form. With this, the arms assumed a constant tonic contracture across the chest, each elbow strongly flexed. They could be passively extended only with great difficulty. The physicians who saw her then placed the arms in full extension in plaster casts, worn for three weeks. This resulted in the arms becoming rigid at full extension. It has been quite impossible to flex either elbow since.

There is usually a fine tremor of the hands. There have been no pyramidal tract signs.

X-ray of the right arm showed a faint suggestion of new bone formation at the elbow, possibly beginning ankylosis. In the left arm, bony changes are absent and the high degree of muscular tone apparently alone produces the rigidity of this arm.

In discussing these cases, DR. FOSTER KENNEDY pointed out that this second case was practically the reverse of that shown by Dr.

Abrahamson. There was here apparently overtoning of the cervical group of muscles. The trunk muscles were not affected.

DR. ABRAHAMSON called to mind a case of spondylosis rhizomelia exhibiting the same pains and attitude and rigidities of the second case in which the conditions had been the result of immobilization. There were, however, no signs of cord or brain implication. He regarded the case presented as both lethargica and spondylosis.

DR. C. B. CRAIG had seen the first patient at the Neurological Institute for a period of two weeks in June. His condition was the same then as now. It was observed that the motility ceased during sleep. Faradism had proved a great relief, its effects lasting from one to three hours. This was probably a fatigue phenomenon. The case was diagnosed chorea following lethargic encephalitis.

DR. BERNARD SACHS remarked on the interest attaching to two such diametrically opposed cases. He hoped to gain anatomical information from them. He was especially interested to know what part of the brain was responsible for the disturbances of motility. The condition of the last patient resembled that of certain infantile hemiplegias, that he had seen. In Dr. Abrahamson's case the movements were distinctly choreic, arrhythmical, more or less purposeful, of slightly explosive character. They were slower than ordinary chorea minor, and not so fast as electric chorea. Yet they were distinctly choreic as opposed to myoclonic and myotonic. The part of the nervous system that was responsible would be highly interesting to know. The movements were evidently the result of encephalitic processes and were certainly not hysterical. Dr. Sachs's belief was that of a ganglionic disturbance near one of the larger ganglia and not a cortical disturbance.

DR. MICHAEL OSNATO had also had the first patient under observation since May, 1920, when he was shown to the students at Columbia as a case of encephalitis. He had noticed a rhythmicity of movement, the movements occurring four or five to the second. A considerable improvement had undoubtedly occurred. Malarial parasites had been detected in the patient's blood and suitable treatment had been given.

DR. SMITH ELY JELLIFFE said that the syndromes of post-influenzal and post-lethargic encephalitis were becoming more and more interesting and they were turning up in greater abundance in private practice as the increasing attention to them given in the advancing masses of the literature were making physicians more observant of the possibilities. These cases had been in existence for many years but heretofore had been distributed into larger and looser nosological conceptions and their etiological relationships to the infections largely overlooked, especially to that of influenza, since this disease was too exclusively conceived of as a respiratory disease.

In the cases under consideration, particularly the case of Dr. Davis, emphasis had been laid upon the segmental distribution of the tonic fixation. It involved an entire limb. One point of possible localization

had been omitted thus far in the discussion to which Dr. Jelliffe thought attention might be directed. This was the possibilities of cerebellar pathway disturbances in certain types of cases, of which Dr. Abrahamson's case might be an example. The studies of Bolk and Rijnberg have cleared up much of our knowledge concerning the localization of function of limbs in the cerebellum, and some cases were on record where segmental motor disturbances of a choreic or tic-like character as seen in Dr. Abrahamson's case could be referred back to foci of destruction in the cerebellar mechanisms. Thus Klein had reported an interesting choreic-like disturbance from a small cyst in the dentate nucleus [*Monatschrift für Psychiatrie und Neurologie*, 1918]. Inasmuch as the fatal cases are usually fulminating and rarely afford opportunity to clear up the complete pathology, it would probably take years before the valuable localizing lessons could be gained from the study of these residuals of mesencephalic involvement.

DR. ABRAHAMSON in summarizing the discussion on his patient said that he doubted the correctness of the localization in the cerebellum, since the patient showed none of the symptoms of cerebellar disease. His case was distinctly one of disease of the communicating pathways and not of the centers.

PRESENTATION OF A CASE OF PYRAMIDAL SCLEROSIS FOLLOWING ELECTRIC BURNS

DR. FOSTER KENNEDY showed a patient in whom an almost pure pyramidal tract change had taken place. The patient had been working in front of a dead cable when a charge of 1,100 volts was sent through it. He remembers nothing of the accident and was unconscious for eleven hours after it. The accident occurred six years ago. He was paralyzed immediately thereafter. He has now spastic legs and double ankle clonus. There is control of the bladder, but incomplete control of the rectum. A large scar is visible on the left scapular showing point of ingress of the charge, and a smaller one is found on the left buttock at the point of exit. There are no neurological signs of interest except the spastic paraplegia. The burn was a third degree burn. Within two years of the injury the patient began to have a double cataract. The lense in the right eye has been removed. Dr. Kennedy said that his information in regard to nervous system results of this type of injury was slight, and asked for any points of interest from the audience.

DR. JELLIFFE said that by chance he had just finished a revision of the chapter on electric injuries in Peterson and Haynes, *Legal Medicine*, and had thus had occasion to review the extensive literature. Results of electric injuries of this type, producing myelitis from lumbar foci were extremely rare, but were well known. A review of the entire literature has been given by Jellinek quite recently.

DR. ABRAHAMSON asked whether the pathology of this case would

resemble cases of caisson disease. DR. JELLIFFE pointed out that the force of the current acted as a disruptive agent, whereas the gas in caisson disease had an eruptive effect.

DR. OSNATO was interested in knowing why the current had selected the pyramidal tracts and had missed the others. It seemed strange that the other tracts and cells and columns of the cord had so completely recovered. DR. JELLIFFE said that the current was not selective, but that now six years after the accident, much had cleared up. Disturbances of vegetative function had existed, however, and were still in evidence, notably the cataract.

CLINICAL SYPHILIS OF THE CENTRAL NERVOUS SYSTEM

DR. JUNIUS W. STEPHENSON in a plea for the more fundamental instruction of medical students in the practical aspects of syphilology, gave a brief classification along lines suitable for complete and rapid instruction. In attacking the nervous system, Dr. Stephenson pointed out, lues rarely attacks *en masse*, but produces symptoms referable to a patch of meninges here or there, a blood vessel of small caliber, or a tract in the spinal cord. The accuracy of diagnosis depends largely upon the individual's knowledge of the anatomy and physiology of the nervous system. The successful treatment of syphilis, accordingly depends upon proper discrimination as to what anatomical physiological destruction is caused by the initial invasion, the condition of certain structures being unalterable, while others would be amenable to treatment. Thus the importance of the early recognition of syphilis is to be emphasized. When the average patient reaches the neurologist, the damage is usually too extensive for much improvement. The ability to recognize the disease in the early stages is therefore of the utmost importance.

The one criterion of syphilis is the Argyll-Robertson pupil, but this is not a preliminary sign. Any irregularity of the pupil in patients below the age of forty years should be considered luetic until proved otherwise. A further sign of diagnostic value is one that Dr. Stephenson has styled the "dead man's pupil." Experience is necessary to recognize this sign.

The symptoms of syphilis within the cranium, those of meningitis, isolated gumma, cerebral vascular syphilis, thrombosis of the posterior inferior, cerebellar artery, general paresis, meningeal and parenchymatous, syphilis of the optic nerve, are briefly outlined, following which Dr. Stephenson surveys the branch of syphilis involving the spinal cord and touching upon the principal diagnostic points and certain special tests and signs that he has found of value. The entire field of syphilitic disease is rapidly summarized and the earmarks of the various types set forth for rapid and easy assimilation.

DR. KENNEDY in discussing Dr. Stephenson's paper, spoke of the curious refractive phenomenon which caused what Dr. Stephenson had designated as the "dead man's pupil." Although, as he had said, it

required skill in learning to recognize it, yet Dr. Kennedy felt that it had a diagnostic value.

STUTTERING: ETIOLOGY AND THERAPY

MISS HANNAH M. CREASEY [by invitation] stated that it was her impression that speech specialists should endeavor to gain the co-operation of neurologists if the profession of speech correction were to assume the dignity and gain the respect that it deserved. In Miss Creasey's work she had found that there was no royal road to recovery. Her object in presenting her methods was to show the philosophy underlying them.

Stuttering [including stammering] she defines as the inability to speak at will. It is a mental condition a psychic neurosis, not physical, and frees itself in somatic symptoms, such as cramps and excessive tension of the organs of speech. There is lack of harmonious working between the brain and the speech organs. The speech mechanism is not at fault. It is the mind that is tied, not the tongue. Stuttering must accordingly be traced further back than the symptoms, or even the trauma producing the symptoms.

Every experience which produces a painful effect of fear, anxiety, shame, etc., may act as a psychic trauma, and may produce pathological results if it falls on fertile soil. "In order to create nervousness," says Charcot, "two factors are necessary—one permanent [the neuropathic predisposition], the other contingent [the provoking agent]." A shock may have brought out the symptoms revealing the permanent neurotic background. After the effects of the shock have been removed, the symptoms cured, another shock may again reveal the constitutional weakness and the cure be undone. This has occurred in many of the so-called shell shock cases in the war.

The dominant quality in the syndrome of stuttering is fear, and the nature of the fear is fear of people, of speaking before people. On entering school the stutterer carries his fear over from his home environment to anyone in authority, anyone he thinks might be hostile and unsympathetic. In the best of environments, even, *intelligent* sympathy may be lacking. The fear attached to stuttering is a morbid fear. It does not arise from the shock, it arises from an internal condition. The history of frights, shocks, accidents and other attributed causes of stuttering show that they might have resulted in a temporary normal fear. The patient's makeup has predetermined the morbidity of the fear. According to Frink the manifestation of an anxiety hysteria is a morbid fear and the physical accompaniment thereof. Stuttering may be considered a manifestation of anxiety hysteria.

Accepting the premise that stuttering is a fear neurosis [anxiety hysteria] Miss Creasey's treatment follows along the lines laid down for other psychoneuroses. The work is largely a matter of character build-

ing, reorganization of the emotional life. To counteract the attributes of fear, cowardice, and stubbornness, environmental trends are re-organized to bring about a more normal reaction to life, to produce fearlessness, self control and moral courage. An example of this method given was that of a student who when asked why he stuttered more than usual at one time, replied that he had been worsted in a fight. His tendency to expect defeat was pointed out to him and he was told to approach his next fight with his mind made up to win, and to stay at the job until he did so.

The personal equation of the doctor in this branch of therapy as in all others is of great importance. The understanding of the individual, and letting him know that the doctor understands his peculiar difficulties will go far towards altering his attitude towards others. Thus with friendly cooperation of teachers and schoolmates, Miss Creasey has found that the fear will gradually give way.

The stutterer's bodily health and environment should have careful attention. Segregation of stutterers is not desirable. The symptoms may be removed under institutional care, but the problems in the unfamiliar outside world will cause them to return again. Children should be kept in school and in touch with normal life in every possible way.

To attain fearlessness the patient is given a new method of speech. The sufferer is stuck by an inability to get over the initial consonant sound to the vowel. The psychic fear causes an overinnervation in the occlusive, consonantal sounds, and an inability to coordinate the consonant with the vowel in the syllable. The patient is shown that normal speech differs from his in the weaker consonantal obstruction. The work proceeds with the syllable, coordinating the consonants and the vowels. Vowel valuation is made the keynote of the work. The patient is trained to consider the vowels as life savers. The mental attitude of fearlessness and self-confidence inculcated by the care of the treatment together with the scientific aids to phonation when made clear and reasonable to the stutterer enabled the work to proceed surely and with lasting success.

DR. A. A. BRILL agreed that the genesis of the stuttering was in the situation of the patient. Many cases of stuttering starting after puberty were easy to cure, since the stuttering was a symptom of neurotic condition. Too much time, he felt, should not be devoted to routine practice. Most of the sufferers should be treated as average psychoneurotics. The prognosis in stuttering is usually bad. The treatment is very lengthy and trying. The permanency of the cure cannot be guaranteed.

DR. JELLIFFE agreed with Miss Creasey's final summary of the extreme complexity of the situation. He did not believe that even the majority of cases could be ranged in the anxiety hysteria group. The reasons for the type of result obtained lie in the nature of the beginning of the neurosis. The compulsive type, beginning in the autoerotic period is treated with extreme difficulty, especially when the muscle erotic is

involved. Such patients are prone to relapse and require much time. Miss Creasey's effort in establishing a transference is sane and advisable. The most promising part of her presentation Dr. Jelliffe felt was the beginning of cooperation between the layman and the neurologist. Neurology needs more help from intelligent laymen. There are not enough neurologically trained physicians to handle psychoneurotic problems in the community. If intelligent cooperation can be established between the neurologist and the sincere helper, much help can be obtained.

MISS CREASEY in closing the discussion said that since the work in public schools had been developed rapid advance had been made. Cooperation and team work made the advance more successful. The work in the schools was more favorable than in private work, since in the home there is backsliding. Until the parents will cooperate, therefore, schools are advisable. Team work was the most necessary to combat the time required and the difficulty of the cure.

Current Literature

I. VEGETATIVE NEUROLOGY

2. ENDOCRINOLOGY.

Laguesse. PANCREAS INTERNAL SECRETION. [Le Scalpel, Jan. 31, 1920.]

The author has studied starvation in animals which he states causes a considerable increase in the growth of the islands of Langerhans, and at the same time an increase in its internal secretion. The indication, therefore, especially at the onset of diabetes and in cases of slow development, is to increase by this process the patient's internal secretion. Absolute starvation is not necessary, as it has been found that temporary suppression of meat and substitution of toast for new bread, associated with sodium bicarbonate, are enough to diminish the sugar in the urine or soon make it disappear entirely. On the other hand, this regimen diminishes the secretion of pancreatic juice. Laguesse notes that during the occupation of Lille by the Germans several practitioners found that many cases of glycosuria were improved or cured spontaneously as the result of underfeeding, which was the rule at that time.

Reichman. A PECULIAR SYNDROME ASSOCIATED WITH ADENOMA OF THE HYPOPHYSIS. [Deut. Arch. f. klin. Med., 130, 1919, p. 133, J. A. M. A. Ed.]

Hitherto there have been two clear-cut clinical pictures associated with disease of the hypophysis: acromegaly, first accurately described by the French clinician Pierre Marie, and the syndrome described many years later by Fröhlich as dystrophia adiposogenitalis. It has generally been assumed that acromegaly is an indication of hyperpituitarism, while Fröhlich's syndrome is a manifestation of hypopituitarism. The work of American observers, and particularly of Harvey Cushing, has thrown a good deal of light on the subject of disorders of the hypophysis, and has indicated that in addition to these classical pictures certain atypical manifestations may at times be associated with disease of this gland. Reichmann has recently recorded two examples of a third fairly clear-cut syndrome associated with disease of the hypophysis and easily distinguishable from either acromegaly or Fröhlich's syndrome. The prominent clinical features presented by his patients were turgidity and cyanosis of the face, with exophthalmos and dilated pupils; cardiac hypertrophy, with hypertension and bradycardia; glycosuria, premature menopause, pronounced myasthenia, edema of the legs, and a blood pic-

ture showing a decrease in the lymphocytes. In the patient who came to necropsy, the lesion was a chromophil adenoma of the anterior part of the hypophysis, such as has been described by Benda as characteristic of acromegaly. The necropsy disclosed in addition a small thyroid rich in colloid material, and a slight but definite hyperplasia of the suprarenals. There was also osteoporosis in the bones of the vertebral column, and the patient had noted that her stature was gradually decreasing. It is apparent from the pathologic findings in this case that, while the main lesion was in the hypophysis, there was evidence that other glands of internal secretion were involved. The thyroid was smaller than normal, and the suprarenals were somewhat hyperplastic. Indeed, Reichmann had concluded during the patient's life that the syndrome was probably a polyglandular one. Reichmann is of the opinion that the clinical picture presented by these patients is not exceedingly uncommon. It will, of course, require further reports to determine whether this is the case. History has usually shown that the description of a new syndrome is followed by its recognition in various parts of the world, and there is little doubt that other reports on this peculiar condition will appear in the literature if Reichmann's assumption is correct. Since our knowledge of the glands of internal secretion is still very fragmentary, observations of this sort are stimulating both to the clinician and to the laboratory worker.

Faber, K. PITUITARY DWARFISM. [Ugeskrift for Laeger, December 11, 1919.]

The author here reports two cases of dwarfism showing that pituitary deficiency does not always lead to gigantism, but may occasion defective growth, or infantilism. The first case was that of a 17-year-old boy, whose height was 127 cm. The trunk and limbs were well proportioned, except for the limbs being a little too short in comparison with the trunk, and the head contributing to one sixth of the total height. His features and the shape of his head were infantile, and there was no beard nor growth of hair on the pubes or in the axilla. The genitals were those of a little child; the scrotum was empty, the penis was only 2 cm. long. He was plump, the distribution of fat giving his body a feminine appearance. There was no edema or evidence of myxedema, and there was no glycosuria, but the total daily excretion of urine amounted to 2,000 to 3,000 cm. Examination of the eyes revealed atypical homonymous hemianopsia, suggesting a lesion near the chiasma. The second case—that of a lad also aged 17—presented so many points of similarity to the first case that the two might have been twins. In both cases the x rays showed a definite shadow just above the sella turcica, interpreted by the author as a sign of calcification of a benign tumor. Discussing the treatment of such cases, he finds an operation too dangerous, and he admits that though x -ray treatment is comparatively safe, the prospects of its proving beneficial are rather meager.

Atwell, W. J., and Sitler, I. ANLAGEN OF PARS TUBERALIS. [Anat. Record, Vol. 15, No. 4.]

The epithelial portion of the hypophysis consists of three parts. The *pars anterior propria* constitutes the main bulk of the gland. The *pars intermedia* is a thin layer, epithelial in nature, which becomes intimately associated with the neural lobe. The most recently recognized epithelial lobe is the *pars tuberalis*, which extends forwards from the junction of the other two lobes, surrounds the infundibular stalk and spreads out under the brain floor in close relation to the *tuber cinereum*. The *pars tuberalis* has been confused with the *pars intermedia*, but these two parts have been shown to be different, both in adult structure and in development history. W. J. Atwell and Ida Sitler have found that the *Anlagen* of the *pars tuberalis* may be discerned very clearly and precede the development of the *pars intermedia* by a considerable period of time. Their first observations were on the rabbit, but in the Anatomical Record (Vol. 15, No. 4, November 20, 1918) they record their studies of wax-plate reconstructions of the epithelial portion of the hypophysis from chick embryos of 48 to 144 hours of incubation. In the 48-hour chick the hypophyseal pouch is well formed and there is no indication of the lateral lobes. The anterior end of the foregut, which is to form Seessel's pouch, extends farther cranially than does the hypophyseal pouch. The oral membrane is intact. In the 59-hour chick (30 pairs of segments) the hypophyseal pouch has deepened and exhibits two lateral enlargements near its attachment to the oral epithelium. These are the *Anlagen* of the lateral lobes from which the tuberal processes develop. There is a small perforation in the oral membrane. After 67 hours' incubation the lateral lobes show more prominently, due to the hypophyseal pouch beginning to be constructed off from the oral cavity. Each lateral lobe contains a lumen communicating with the cavity of the main hypophyseal sac, with the dorsal wall of which Seessel's pouch is in contact. In the 72-hour chick the hypophyseal *Anlage* is closely applied to the brain wall. The lateral lobes are more prominent and the lumen of the pouch extends well into each lateral lobe. There is an extensive communication between the cavity of Seessel's pouch and the hypophyseal sac. In the five days (120 hours) chick a definite hypophyseal stalk has formed, communicating between the lumen of the hypophysis and the oral cavity. The lateral lobes have increased in size, their transverse diameter being almost twice that of the superior part of Rathke's pouch. They are united around the nasal end of the hypophysis, and their lumina no longer communicate clearly with the hypophyseal cavity. Seessel's pouch is now represented by a solid bud of cells, just dorsal to the hypophyseal stalk. At the end of six days' (144 hours) incubation the hypophyseal stalk is much elongated and has become solid. Distinct tuberal processes have now formed from the lateral lobes and are directed toward the brain wall. They take origin from about the middle of the inferior or proximal half of the hypophysis, with which

the distal half, being bent dorsally, now forms an angle of 90° . From these observations it is evident that the lateral lobes are formed from the nasal wall of the early hypophyseal *Anlage*. Their early appearance in development indicates that they and their derivative in higher vertebrates, the *pars tuberalis*, are of fundamental phylogenetic importance. [Med. Jl. Austr.]

Howard, C. P. ACROMEGALY AS A POLYGLANDULAR SYNDROME. [Am. Jl. Med. Sc., Dec., 1919.]

Secondary hyperpituitarism according to the studies here reported may result from a greatly or rapidly increasing intracranial pressure. A decrease in the sugar tolerance in the presence of other symptoms of disturbance of pituitary function would, he believes, justify a diagnosis of increased activity of the *pars intermedia*. In demonstrating a hypofunction of the chromaffin system the epinephrin conjunctival test may be of real value in dyspituitarism, but he deems the subcutaneous epinephrin test of doubtful value in both normal and pathologic cases. Both are too equivocal to be depended on for studying the hypophysis as to its functional powers. No definite influence seems to be exerted on the symptomatology either by administering internally the whole gland or anterior or posterior lobe.

Dudley, H. W. ACTIVE PRINCIPLES OF PITUITARY GLAND. [Jl. of Pharm. and Exp. Therapeutics, Dec., 1919.]

Dudley gives a method for preparing crystalline residues, using extracts of the posterior lobe of the gland. It seems to have great physiological activity. The dried and powdered infundibulum is extracted with acidulated water, and the solution treated with colloidal ferric hydroxid, followed by continuous extraction of the filtrate with butyl alcohol at reduced pressure. A crystalline residue containing all the uterine stimulant, also some of the pressor principle and contaminating substances is yielded. Abel and Kubota thought the uterine stimulant and histamin identical, but Dudley regards them as two distinct chemical substances. True, there is a point of similarity in that both are readily extracted from alkaline solution by butyl alcohol. The pressor principle is less easily extracted from acid solution than the pituitary uterine stimulant.

Webster, J. H. D. ROENTGEN-RAY TREATMENT IN EARLY ACROMEGALY. [Arch. of Radiology and Electrotherapy, Jan., 1920.]

Webster asserts acromegaly eminently suited for X-ray treatment, though many affirm the treatment to be only based on theory. The author specially offers good results where the disease is only beginning, for then the anterior pituitary lobe would present simply a chromophil hyperplasia and much skeletal change, local pressure damage or sec-

ondary tumor-like formation would be non-existent. He gives a patient who had sixteen treatments with hard filtered rays from temporal and frontotemporal areas, the first eleven once a week, then fortnightly, even latterly monthly or longer. There was rapid relief and disappearance of the headaches. The "queer feelings" dropped to about one a month. Irritability and depression were hardly noticeable. She lost about seven pounds in weight. The eyes showed the greatest change: the discs became normal; the field of vision much enlarged, especially for red, though there was some irregular contraction, mainly inferior temporal. Beyond irradiation there was no treatment save a few bromide powders. Nearly two years later she was seen again, when her condition, subjectively and objectively, had become aggravated. A successful operation by the nasosphenoidal route was done.

Mott, F. W. THE TESTES, FROM BIRTH TO OLD AGE. [British Medical Journal, December 6, 1919.]

A report, based on the examination of the testes of 100 patients in London asylums and various civil and military hospitals who had died at ages from birth to eighty-six years, is given by F. W. Mott in which the seminal vesical fluid was frequently examined; also seminal vesical in several dementia præcox cases, the thyroid, adrenals, and the pituitary glands. The details of the development of the testes from birth to puberty are detailed. Patients dying before puberty of chronic tuberculosis, congenital sphyilis, chronic morbus cordis, etc., showed appearances of complete arrest of the development of the seminiferous tubules. Normal spermatogenesis was studied in cases of death from shock in severe injuries. Active spermatogenesis was seen in all stages and the interstitial cells contained abundant lipoid, as did also the spermatogonia and especially the Sertoli cells, both of which were filled with fine lipoid granules. Where there are sheaves of spermatozoa, the granules in the Sertoli cells are less abundant. The immature spermatozoa dive into the Sertoli cells and there acquire their tails. Evidence is given to show that the lipoid substances described constitute the raw material from which the nucleic acid, necessary for active nuclear proliferation and spermatogenesis, is formed. Reasons are given for supposing that the lipoid granules are derived from the lipoid stores in the cortex adrenalis. It is confirmed that the lipoid content of the cortex adrenalis is diminished in microbial intoxications, but however much this is diminished, that in the testes is apparently unaffected.

In sixty-six successive cases of general paralysis, spirochetes were found in emulsions of the brain by dark field illumination, while in fifty cases in which emulsions of the testes were examined the spirochete was not found once. Examination of the testes in a large number of cases of general paralysis failed to show any in which there was complete arrest of spermatogenesis. Some showed very active spermatogenesis, while a considerable number showed islands or strands of atrophied

tubules, probably due to local obstruction of vasa efferentia by gonorrhea or syphilitic inflammation. The testes in twenty-two cases of dementia præcox showed atrophy varying from a change in the biochemical reaction of the head of the spermatozoa to a complete regressive atrophy of the seminiferous tubules.

Tyrell, E. J. A CASE OF POLYCYTHEMIA VERA (RUBRA) COMPLICATED WITH HYPERTHYROIDISM. [Br. M. J., Nov. 8, 1919.]

A man of middle age—an outdoor representative of a commercial firm—came to see me on account of frequent attacks of “vertigo.” The story he told was that for the last eight years he had been acquiring a gradually deepening blue tint of face accompanied by digestive disturbances and “high blood pressure.” He had been treated for arteriosclerosis for over two years with apparently no very great success. About eighteen months previously he was caught in an air-raid and had to run for shelter. This upset him greatly. Within a few hours he noticed a swelling in the lower part of his neck which rapidly increased in size and became as large as his fist in about 24 hours. This was treated with iodine and massage. The swelling gradually receded until it became as small as a hen’s egg—at which size it has remained. He, later, became nervous, irritable and impatient: short of breath and complained of increasing muscular weakness. During the last month he had been subject to several attacks of what he termed “vertigo.” The attacks recurred at intervals without any special cause. They lasted only a few moments and were accompanied by dizziness, and slight confusion of ideas and speech. He would be speaking to some one when he would suddenly feel giddy, and grasp hold of something for support. Sight for a moment would be lost, he would continue speaking and in a few seconds he would recover to find himself saying things which were without meaning. In a short time, he would be all right again and feel no ill-effects—except perhaps a little anxiety.

The man was of spare build and temperate habits, his appearance one of well-marked cyanosis of ears, lips and face; hands were blue and cold. His superficial vessels were thickened and tortuous. The right lobe of his thyroid gland was enlarged. His eyes were a little prominent and conjunctivæ injected.

The pulse was 68 whilst sitting—steady and regular—the radial artery was hard and thickened and easily palpable. Systolic blood pressure was 120 mm. Hg. There was no enlargement or dilatation of the heart. The spleen was increased in size and reached three inches below the costal margin. A blood count was taken and revealed 9.6 million red and 25 thousand white cells per cmm. Hemoglobin 125 per cent. The urine contained a trace of albumin, but no casts or abnormal cells.

His description of his recent attacks of giddiness and confused speech gave me the impression that they were something in the nature of “petit mal.” His blood was very viscous, and viscosity of blood and epilepsy

have been associated together. Hence these slight cerebral manifestations were probably directly due to a temporary anemia of brain, no doubt caused by excessive viscosity and inability of the heart to exert sufficient driving force to supply the more distant parts against gravity and thickened, narrowed and inelastic vessels.

The enlargement of the thyroid gland induced me to look up McCarrison's description of the blood changes in thyroid disease. He states that the number of erythrocytes and leucocytes are diminished as well as the hemoglobin index, but the coagulability of the blood is increased; this occurs both in exophthalmic and endemic goiter.

It is reasonable to assume therefore that in the normal secretion of the thyroid gland there is a substance which can control, in some measure, the coagulability (or what is practically the same thing, viscosity) of the blood. This substance appears to be lacking in hyperactivity or in disease of the gland. Pursuing the idea still further—as in hyperactivity, the number of red and white corpuscles are diminished—it may be that a like increase, or an excess of thyroid secretion has the power of stimulating those organs whose activities are devoted, in part, to coping with and destroying redundant blood corpuscles.

Hence I am led to think that thyroid gland substance—or perhaps what is still better—a polyglandular substance, may be indicated in conditions similar to the above.

Having the courage of my opinion I have given my patient Capsules of Polyglandin regularly for four weeks.

At the end of that period a blood count showed 8.2 million red and 38 thousand white cells per cmm. Hemoglobin 126 per cent. The attacks, however, have become less frequent and less confusing. Whereas, he was subject to two or three attacks each week, he had only experienced two, during the last four weeks.

His pulse felt more elastic: blood pressure was unaltered. The urine showed no trace of albumin. His general condition was much improved and he felt better in every way.

This very short course of treatment is insufficient to prove anything—but it is certainly hopeful. [Author's abstract.]

Legiardi-Laura, C. ANTIPITUITARY SERUM. [New York Medical Journal, Nov. 1, 1919.]

On the basis of well-known facts concerning the influence of the pituitary body on blood pressure, on general metabolism and more notably on sugar metabolism, as evinced by the works of Cushing, Goettsh and Jacobson and others, in this country, and of Shiff, Vassale, Caselli, DeBovis, Bolaffio and others abroad, the author proposed to see whether an antagonistic serum could be produced by "immunizing" the horse with pituitrin, and whether any practical application could be derived.

Regarding its action on blood pressure, the serum, used in 40 patients, caused the blood pressure in thirty to fall more or less, according

to individual sensitiveness. This was noted in every case, after injection, seeming to indicate the new serum to be antagonistic to the internal secretion of the pituitary body, as far as blood pressure is concerned. Thirty cases of diabetes mellitus were treated; of these, 8 did not respond with any noteworthy diminution of glycosuria, 14 had a complete disappearance of it while the intake of carbohydrates was notably increased; in 8, a diminution of glycosuria was seen. Polyuria commonly disappeared with rapidity, even in the most unfavorable cases. The favorable ones also showing improvement of the general condition and of special symptoms such as neuritis, retinitis, emaciation, headache, etc. Four cases are reported *in extenso*. [Author's abstract.]

Gordon, M. B. PINEAL GLAND IN PEDIATRICS. [Endocrinology, Oct.-Dec., 1919.]

The author does not consider that sufficient facts have been given in the literature to allow of any firm opinion as to the functional activity of the pineal gland. Does it possess an internal secretion? Nothing has been proved. Experimental work has failed to prove that it possesses a function, and no experimental studies are so complete as to allow comparison with the very striking syndrome seen clinically. Horrax and others maintain that the pineal gland controls the inhibition of sex growth, then pineal feeding should postpone adolescence, but by Dana, Berkeley and McCord proved the opposite. Yet, if the feeding results of McCord are correct, strong evidence of a pineal function ought to have followed the extirpations of Dandy and Horrax. Finally, Gordon says all knowledge of the pineal function is more problematic than accurate.

Krabbe, K. EARLY SYNOSTOSIS OF THE EPIPHYSIS WITH DWARFISM IN PUBERTAS PRÆCOX. [Endocrinology, Oct.-Dec., 1919.]

The case given by Krabbe is a girl thirteen and a half, who, when only a few months old, had bleeding from the vagina with recurrence every four weeks since. From the sixth to the seventh year the breasts were the most prominent, then there was a diminution in size; now they are like the breasts of a middle-aged virgin. For two or three years a growth of hair in the axilla and over the pubis was noticed. Her hips and thighs have always been large. Growth was rapid until she was seven, since that time it has stopped. The lower limbs are strikingly short in relation to the trunk. X-ray showed a normal sella turcica. The epiphyseal fissures of the lower and upper limbs were completely grown together. The patient's face is childish and gives no evidence of sexual knowledge in spite of the marked development of menstrual function and external evidences of sexual maturity. Seeing this, no intravaginal examination was made, so the possibility of an ovarian abnormality being the cause of the condition could not be eliminated. Thyroid

and pituitary diseases do not produce this type of dwarf. In these the epiphyseal fissures remain barely open, but for an abnormally long time.

Meyer, William. CONCERNING THE HYPOPHYSIAL AND EPIPHYSIAL DISTURBANCES IN HYDROCEPHALUS INTERNUS. [*Zeitsch. f. d. ges. Neur. u. Psych.*, 1918, Vol. 44, p. 101.]

Hydrocephalus internus may give rise to symptom complexes of various forms, and sometimes the symptoms resemble very closely those produced by tumors of the hypophysis. The author observed in a whole series of cases of hydrocephalus internus slight symptoms of disturbance of the pituitary functions (obesity, indications of acromegaly etc.), and in three cases there were very serious symptoms referable to disturbance of the hypophysis and epiphysis. The first case described is that of a girl, four years old. There was extreme obesity with distribution of fat characteristic of hypophyseal disturbance, but no indications of a primary disease of the pituitary body. There were, however, in the shape of the skull, the mental deficiency, etc., very marked signs of hydrocephalus internus and this affection probably disturbed the functions of the hypophysis through pressure. The second case was that of a boy nine years old with distinct signs of hypophyseal disturbance (dystrophy of genitals, adiposity, indications of acromegaly). There were no signs of primary disease of the pituitary, but distinct symptoms of hydrocephalus, leading again to the conclusion that the hypophyseal symptoms were result of a secondary affection. The third case, of a girl eight years of age, the author interprets as a serous meningitis which, through pressure from within, caused disturbances in the hypophysis and epiphysis.

II. SENSORI-MOTOR NEUROLOGY

1. PERIPHERAL NERVES.

Bradford, J. Rose, E. F. Bashford, and J. A. Wilson. ACUTE INFECTIVE POLYNEURITIS. [*Quart. Jour. Med.*, Oct., 1918, and Jan., 1919.]

Their clinical account is based on the observation of 30 cases occurring among British soldiers in France between the ages of 19 to 49 years. Usually, but not always, an opening illness, with general symptoms, followed by a latent period of several weeks, precedes the palsy. It may appear gradually, or with dramatic suddenness, and is usually widespread, affecting more especially the large muscles of the limbs and trunk, but not exclusively confined to them. The face is almost always affected, generally on both sides. Individual muscles and groups of muscles are not picked out, hence the trunk and limbs are affected as a whole. It is nearly always progressive and may conform to the ascending type. Muscular wasting is not a feature. Sensation is constantly affected. As early symptoms, there are subjective pains, numbness and

tingling. Anesthesia and analgesia, especially in the distal segments of the limb, come later. This sensory loss is usually incomplete, relative rather than absolute. The tendon reflexes are lost in all declared cases of motor palsy and sensory loss. The sphincters are not profoundly affected, nor are the cerebral functions. Tachycardia, albuminuria and leucocytosis are inconstant features. Progress is slow. Serious, even fatal, symptoms, in cases not regarded as such may be expected. In the series of 30 cases, death occurred eight times and respiratory failure was the dominant cause. That the disease can be reproduced in monkeys by the subdural inoculation of an emulsion of human cord preserved in glycerine, or by direct inoculation from monkey to monkey of emulsion of the fresh cord, or of cord preserved in glycerine is claimed by Bashford. He says it has been induced by the inoculation of a pure culture of an unknown organism prepared by Wilson. The animals all showed an incubation period of from five to six weeks, after which lassitude, loss of appetite and signs of paralysis insidiously appeared. There were no deaths, but some suffered a good deal. Microscopically, in both man and monkey, patchy degenerative changes were found in the spinal nerve cells, in the peripheral nerves and in some muscles and some interstitial changes in the posterior root ganglia. The cerebral cortex was unaffected. The changes seem to differ pathologically from those of acute poliomyelitis (relative absence of vascular change) though allied to them. The disease is grouped as an infective disease of the nervous system whose pathology is at present obscure. Wilson employed the technique of Flexner and Noguchi (sterile guinea-pig-kidney, etc.) and succeeded in growing pure cultures of a minute, rounded, oval or kidney-shaped organism, measuring 0.2μ to 0.5μ in diameter, grouped in colonies and sometimes assuming bacillary form, difficult to stain, essentially anaerobic, weakly saprophytic (usually dying out in the fifth generation), therefore unlike the globoid bodies of acute poliomyelitis, though otherwise similar. A culture of this organism is pathogenic to a monkey. The problem of the biological position of the globoid bodies of acute poliomyelitis is also the problem of the origin of polyneuritis.

Maas, Otto. CONCERNING A TYPICAL POLYNEURITIS. [Neurol. Centralbl., September 1, 1918, No. 17, Vol. 37.]

Polyneuritis usually begins with pain and dulling of sensation, and, afterwards, a greater or less degree of paralysis develops in an acute or subacute manner, which, a few weeks or months after the first symptoms ends in gradual recovery. According to Oppenheim it is only in exceptional cases that a period of several years elapses before the disappearance of the paralysis. Occasional cases in which the course is chronic are observed; in these the ataxia is the foremost symptom, though usually in some limited regions there are signs of degenerative paralysis. Two cases of chronic polyneuritis are given. In the first there were no signs of degenerative paralysis. Besides the symptoms,

pressure to pain in the muscles and nerve trunks, there was an ataxia which lasted for years. The patient 67 years of age was addicted to alcohol. Wasserman negative. The ataxia of the upper and lower extremities developed gradually and afterward there was a certain degree of recovery. From the hyperalgesia on pressure of the muscles and nerves and the ischialgia, the author, after excluding other diseases which might be suggested by the symptoms, as, tabes dorsalis, myelitic or cerebellar pathological processes, assumed the case to be one of chronic polyneuritis, although this diagnosis could not be made with absolute certainty. The second case was that of a carpenter, forty-three years of age. The anamnesis showed there was no abuse of alcohol. At the age of thirty-four he had slipped on an oiled floor and hit the back of his head and his left side on a planing bench. He did not become unconscious but had bleeding of the nose. Afterward symptoms of pain in the tendons and disturbances of sensibility set in, followed by an excitement with pain in the whole body and disturbances of motility. He was taken to an insane asylum where various other symptoms manifested themselves, among them disturbances of vision, including diplopia. When the patient came to the author's observation various diagnoses had been made "Lues cerebrospinalis," "tabes dorsalis combined with dementia paralytica," "traumatic hysteria," "probable organic disease due to syphilis or alcohol, set into activity by the accident." The author thinks all syphilitic processes, strictly speaking, could be excluded with certainty, and he made a diagnosis of chronic polyneuritis, though certain symptoms, as the psychic disturbances at the beginning of the disease and the nystagmus, indicated a degree of involvement of the brain and cortex. Under observation the condition of the patient improved to a great degree. The course of this case was remarkable. First was a stormy beginning with pain, severe psychic symptoms, paralysis of the arms and legs and bulbar symptoms. After two and one half years a slight improvement set in, which afterwards made steady and slow progress. The author thinks that probably the disturbances were connected with the trauma. A peculiar symptom was a color-blindness which seemed not to be congenital; both the author and Dr. Alfred Moll who also examined the patient were of the opinion that the color-blindness was acquired.

Dide, M., and Courjon. HYPERTROPHIC NEURITIS. [Rev. Neur., Nov., 1919.]

Five cases (with illustrations) are given. The extreme atrophy of muscles began in the hands and arms in five personal cases while Long and Hoffman had four. In thirteen known cases no inherited or familial taint was discoverable. In ten the onset was between 30 and 40. The disease may assume various types in adults, and complicating cerebellar symptoms are rare.

Söderbergh, Gotthard. CONCERNING THE SYMPTOMATOLOGY OF THE 7TH AND 8TH MOTOR DORSAL ROOTS. [*Neurol. Centralbl.*, 1919, Vol. 38, No. 5, p. 146.]

Two previous cases in which the abdominal syndrome was observed have already been published by the author. Recently he had opportunity to observe a tumor accompanied by abdominal symptoms and from these was able to diagnose the level of the tumor in the spinal column. The patient had observed spasms in the upper right section of the abdomen. In their mildest form there was a clonic twitching of the right rectus muscle above the navel. At times fascicular contractions in the course of the fibers of the upper part of the right obliquus externus made their appearance, and there was constantly a distortion of the navel upward and somewhat to the right. A diagnosis of an irritation of the right anterior seventh dorsal root was made. Later, at times, a more tonic condition of the abdominal muscles was observable. A "défense musculaire" included the right rectus muscle above the navel and the upper middle third of the right lateral abdominal musculature. The navel was permanently distorted more upwards than toward the right, and the median line, especially the supra umbilical, formed a certain convexity toward the right. The author therefore extended his diagnosis to include the eighth anterior root on the right. At the section a tumor the size of an almond was found behind the medulla on the right between the dural point of exit of the seventh and eighth dorsal roots, pressing closely against the seventh. The medulla itself, of which the 8th and 9th segments were to the greatest degree involved, was bent forward and to the left. The conclusion was drawn that a segmental innervation of the abdominal muscle actually exists and that it is dorsal 7 which principally innervates the homolateral rectus muscle above the navel and nearly the whole of the upper third of the lateral abdominal musculature; while it is dorsal 8 which principally supplies the middle third of the lateral abdominal wall down to a little below the horizontal navel line. He also calls attention to the fact that his experimental results in regard to the motor root functions may be of great practical use for the diagnosis of the level of tumors of the medulla oblongata.

Bostroem, A. ISOLATED INJURY OF THE RAMUS SUPERFICIALIS DUE TO WOUND OF THE NERVUS PLANTARIS LATERALIS. [*Neurol. Centralbl.*, September 16, 1918, No. 18, Vol. 37.]

War experiences in regard to injuries of peripheral nerves have already demonstrated in the most unequivocal manner the importance of careful attention to the small muscles of the foot. It has been especially emphasized that, wherever there is difficulty in walking of any sort, electrical examination of the thenar and hypothenar musculature should not be neglected, even where the localization of the injury, the impairment of mobility and sensibility arouse no suspicion of a nerve injury. In the case described, after an accidental pistol shot through the left

foot, there developed a psychogenic paralysis of the entire left foot. After this paralysis had been removed by hypnosis, there was still a slight disturbance in the gait. A paralysis of the musculus abductor digiti quinti, together with paralysis of the musculus flexor digiti quinti, was found, with pronounced abnormal reaction and disturbance of sensibility in the distal parts depending on the N. plantaris lateralis. The path of the shot indicated that the ramus superficialis of the nervous plantaris lateralis, had alone been hit by the shot. The probable permanent ill effect which would have resulted from the injury was a considerable disappearance, through atrophy of the hypotenar, of the soft cushion of the musculature with consequent pain on the outer border of the foot. The subjective disabilities which may result from cases of this sort are out of proportion to the slight motor impairment, and this is a further reason for not permitting even slight injuries to escape notice.

Eberstadt. ISOLATED PARALYSIS OF THE ILIO-PSOAS MUSCLE. [Münch. med. Woch., Sept. 5, 1919.]

Such paralyzes are uncommon, and in many cases not easily diagnosed unless a muscle has a specific function which can be tested with certainty. Ludloff of Frankfort has evolved such a test for the ilio-psoas. Five cases of this paralysis are reported by Eberstadt from Ludloff's clinic. He points out that there are two classes of case according to the etiological factors concerned: (1) Direct with loss of function in the muscle due to congenital muscle defects, diseases of the nervous system, central or peripheral, or local muscle affections; (2) indirect—pelvic and hip-joint anomalies producing loss of function in the ilio-psoas owing to a mechanical alteration in the line of traction; in this class the paralysis is apparent only. Two cases were said to be examples of congenital deficiencies in the psoas muscle, two were due to injuries of the anterior crural nerve (warfare lesions), and one of spondylitis of the lower spine. Ludloff's test is carried out with the patient seated upright with the hips passively flexed to 90 degrees. Inability to flex the hip-joint from the right-angled position, constitutes a positive Ludloff's phenomenon, and indicates paralysis or insufficiency of the ilio-psoas.

Frank, C. PALLESTHESIA [II Policlinico, Sez. Med., Oct. 1, 1919.]

The author's investigations on pallesthesia, or the vibrating sensation are thus summarized: (1) Disturbances of pallesthesia are observed exclusively in cases where the anterior cornua or pyramidal tracts are involved, such as acute poliomyelitis, progressive muscular atrophy of the Aran-Duchenne type, amyotrophic lateral sclerosis, Erb's syphilitic spastic spinal paralysis, and disseminated sclerosis. (2) Disturbances of pallesthesia are constantly observed where there is compression of the cord, especially of the pyramidal tracts, as in incipient Pott's dis-

ease; for which reason, if the compression is only slight, the symptoms may be absent altogether, as in incipient syphilitic spinal pachymeningitis. (3) Disturbances of pallesthesia are constantly observed in diseases of the spinal cord in which the posterior columns are not affected, such as syringomyelia and hematomyelia. They are often found in various affections of the spinal roots, such as tabes incipiens, radiculitis, etc.; yet the changes in vibratory sensation may sometimes be slight, even when the posterior columns are severely affected; that is, disturbance of vibratory sensation is found exclusively and constantly—apart from incipient cases, in which they may be absent—whenever the motor fibers (lateral pyramidal tract) are involved.

2. CRANIAL NERVES AND MEDULLA.

Boveri, P. REDUCTION OF VISUAL FIELD AFTER HEAD INJURIES. [*Atti Soc. Lomb. Sc. Med. Biol.*, 1919, VIII, 107 and 157.]

A remarkable reduction of the visual field can be observed in all those wounded or injured in the head, as well as in most cases of simple commotio cerebri. The reduction generally affects the superior visual zone and is particularly extended in the lesions of the frontal region. There is a certain relation between extension of the lesion and reduction of the visual field. This may last for months and in some cases for years particularly after simple concussion of the brain. In almost all wounds of the head these troubles are associated with various alterations of the optic papilla. Moreover, after severe wounds a bilateral mydriasis with more or less slow reaction to light can be observed. After slighter injuries, with only a certain degree of commotio cerebri, the mydriasis is limited to the affected side, but associated to lasting anisocoria, particularly if the frontal zone is affected. Miosis is rare unless the cervical sympathetic is also affected. (DaFano.)

Mendel, Kurt. DIABETES INSIPIDUS WITH PARALYSIS OF THE ABDUCENS. [*Neurol. Centralbl.*, April 16, 1918, No. 8, Vol. 37.]

The case is given because the author was able to find only five in the literature. His own case at first presented difficulties, as the behavior of the patient, his indifferent and awkward manner, the miosis, the tardy and restricted reaction of the pupils, the weakness of the right abducens, the weakness and sluggishness of the knee reflexes, taken in connection with the syphilis in the anamnesis, the positive Wassermann, and his age, suggested tabes dorsalis or incipient paresis. But further observation, together with the Roentgen examination, showed the disturbances due to a syphilitic disease of the pituitary body. Other writers, especially Oppenheim and Kahlmeter, have noted the occurrence of symptoms resembling tabes or paresis accompanying disease of the hypophysis, and especially of the pituitary body, for which the name pseudotabes or pseudoparalysis pituitaris was suggested. The much-discussed

question of the localization of diabetes insipidus is not entered upon. So much at least is clear from the experiments of Camus and Roussy, that an injury to the interpeduncular region of the base of the brain leads to considerable and lasting polyuria. This is the region where the lesion of the abducens may be assumed to be situated. It would be hard to explain how the trochlearis and oculomotorius could have remained intact with diseases of the abducens and hypophysis if the foci had been situated farther toward the front. The author, therefore, assumes for the cause of his case a meningitic syphilis at the base of the brain in the interpeduncular region, and from his observation draws the following conclusion: Diabetes insipidus combined with paralysis of the abducens (without other paralysis of brain nerves) is a distinct disease picture, a definite and circumscribed symptom complex, due to disease of the interpeduncular region and, where there is no fracture at the base of the brain, a gummatose meningitis in this region should be suspected.

Cheatham, T. A. THE PSYCHOLOGY OF ASTHENOPIA. [Southern Med. Jour., October, 1919.]

In defining "asthenopia," the diversity of views expressed by Posey, Fox, May, Oliver and Thorington, leads the writer to direct attention to the fact that asthenopia, like headache, is a symptom-complex indicative of one or more of many possible conditions which may exist in the eye, the optic tracts, or the cerebrum, individually, in combination or collectively, and, as a pathologic entity, is not a disease. The actual abnormality having asthenopia as a predominant symptom-complex, is a refractive error, a muscular imbalance, or a disturbance of the interpretive centers of the cerebrum, which result respectively in so-called accommodative, muscular and neurasthenic asthenopia.

Unnatural conditions incident to present-day life and the ever-increasing demands made upon the cerebro-ocular system, with special reference to artificial illumination and the universality of "eye-driving" in specialized occupations where monocular vision is forced upon the interpretive centers which have been trained to receive and translate binocular impressions, together with habitual excessive use of the eyes in reading, sewing, etc., are considered as chief etiologial factors.

Psychometrically considered, the cerebrum functionates normally much faster than is indicated by the speed attained by the cerebro-ocular system in receiving, conducting, and interpreting group visualizations; concentration of thought serves to synchronize the differing speeds and facilitates coöperative action among the component parts. The intimate association of thought and vision makes perfect vision an invaluable asset in clear thinking, as imperfect, incorrect, distorted or partial retinal reception of images will be interpreted as received and a hopeless confusion of mental impressions result which preclude the possibility of building up an ultimate conclusive thought from consecutive,

systematized, and interrelated mental pictures occurring in orderly and relative succession. The extraordinary mental and ocular effort made in an attempt to rectify abnormal conditions, inhibits concentration of thought through lack of coöperation and coördination; the highly specialized cells "burn out" their reserve energy and fatigue follows. Asthenopia is the technical name given to the varying group of symptoms which occur temporarily or permanently, as a result of fatigue of any part or parts of the cerebro-ocular system and fatigue may be the cause or result of a refractive error, a muscular imbalance or mental disturbance—truly a vicious circle.

Rest, obtained by the use of correcting lenses, prisms, cycloplegics, abstinence from ocular effort, etc., as per individual indication, is the accepted treatment. Prophylaxis through education of the school child to appreciate the value of sight conservation and the proper method to care for the eyes, is considered to be of the most vital importance to this and future generations. [Author's abstract.]

Barkan, Hans. OCULAR ANGIONEUROTIC EDEMA AND GLAUCOMA. [Am. Jour. Ophth., Nov., 1919.]

Barkan describes a case of glaucoma in which the attacks varying from mild congestive to acute congestive, followed over a period of a number of years without loss of vision or loss of field synchronized with attacks of facial angioneurotic edema. The entire process dates from the year 1911 when a diagnosis of glaucoma was made by Professor Hess and by Professor Hirschberg of Berlin.

Owing to the short duration of attacks, seldom over an hour, and easily controlled at the time by eserine, no anatomic damage has resulted in spite of many attacks in the period of 1911–1919. During one acute attack her lower lid was greatly puffed, her tongue slightly puffed up, some difficulty in swallowing, the whole disappearing after an hour and one half. She never has an angioneurotic edema without a temporary rise of ocular tension.

The case summed up is as follows:

1. Typical attacks of angioneurotic edema.
2. History of gastrointestinal attacks simulating peptic ulcer, probably angioneurotic viscerel edema.
3. Diagnosis of glaucoma in 1911 by Professor Hess and Professor Hirschberg; miotic treatment irregular.
4. Acute attack of glaucoma in connection with angioneurotic edema of lip observed personally.
5. No permanent functional ocular involvement or anatomic change from 1911 to 1918.

The only case found in the literature of ocular involvement and angioneurotic edema is that of Albrecht, whose patient, an 18-year-old girl whom he had observed since the age of 13, had, with every menstrual period an angioneurotic edema of the face the fundus at that

time showing repeatedly marked edema of both discs which was not present in the inter-menstrual period.

Barkan does not believe in the relation of acidosis and glaucoma, arguing that if such a relation existed one should find glaucoma frequently in cases of angioneurotic edema, not rarely, also that it is not plausible, knowing the well-recognized causes of certain classes and cases of glaucoma, that all these causes should only be favoring factors to a localized acidosis and edema. Real acidosis is also often seen in infants and children, but no glaucoma as yet reported. Even in diabetes characterized by an intense acidosis, where is the edema? In this condition also hypotony of the eye is most marked.

It may prove interesting to test the intra-ocular tension of a number of cases of angioneurotic edema during attacks, which, as far as the author knows, has not been done. (Authors' abstract.)

Fry, F. R., and M. Kasak. CONGENITAL FACIAL PARALYSIS. [Am. Archives of Neurology and Psychiatry, December, 1919, pp. 638-644.]

The subject, a girl eleven years old, had a complete absence of motility in the distribution of the seventh nerve on both sides of the face, which was without question congenital. There was an absence of the lateral and oblique movements of both eyeballs, with preservation of the vertical movements and of the pupillary and ciliary functions. There was no lateral movement of the mandible, but vertical motility of same was present and normally strong. The tongue was atrophied and corrugated and its movements limited and wobbly. The girl also had a complete teratological absence of the left breast and a classical teratological deformity of the left hand. These latter two defects confirm what would seem to be the only possible explanation of the peculiarly symmetrical motor defects in several of the cranial nerves just described. There were no sensory changes of any kind.

In intelligence and character the girl was found to be first class for her age, a very apt pupil in school, and of excellent disposition, notwithstanding the great defect in her speech. There were no familial features of special interest.

In reporting this case the authors make a rather practical bibliographic summary on congenital facial paralysis from the clinical, anatomical and pathological standpoints. They cite especially cases reported by H. C. Thomas, in *THE JOURNAL OF NERVOUS AND MENTAL DISEASES*, 1898, and by F. M. Langdon, in the same for 1899; also cases from Sir J. Hutchinson, H. Rainy, J. F. Fowler, F. E. Batten, and a number of others.

In view of the clinical attention the subject has thus far received, the authors intimate that further anatomical and pathological data are much to be desired.

The authors do not comment on the more practical bearings of these cases. It occurs to the editor that in one direction at least, namely that of predisposition to facial palsy, there is an incentive to further study. [Author's abstract.]

3. SPINAL CORD.

Knox, J. H. M., Jr., and Powers, G. F. SPINAL MUSCULAR ATROPHY PROBABLY OF WERNIG-HOFFMAN TYPE. [South. Med. Jour., Feb., 1920.]

Three cases occurred in one family of three very young children. The authors imagine that the symptoms, general symmetrical muscular weakness, noted at birth, with loss of reflexes and diminution in response to electrical stimulation, can be explained on the assumption of a primary spinal atrophy and secondary muscular involvement, not excluding the possibility of a reverse process. The third patient, still living, has improved, which is accounted for by the development of certain intact and enervated muscle fibers. From a study of the literature, many transitional cases seem to occur between the group of cases described as amyotonia congenita (Oppenheim) and those of infantile spinal muscular atrophy (Wernig-Hoffman). Both may be due to a congenital defect in development of the lower motor neuron tract, affecting both certain ganglion cells of the cord and the muscles they supply. Generally, cases of amyotonia congenita represent the less intense and progressive involvement.

Harbitz, F. INFLUENZAL MYELITIS. [Norsk. Mag. for Lægevidenskaben, Jan., 1920.]

Seventy-three persons who died between July, 1918 and 1919, of influenza or its sequelae were reported on by Harbitz, who classifies them according to the organs affected, and shows that scarcely a single organ was immune. One case of myelitis and neuritis was of special interest because influenzal lesions of the nervous system are seldom seen at *post-mortem*, though influenzal neuralgia and neuritis are familiar. The patient, a woman of 52, a few days after contracting influenza developed headache with partial loss of vision, first on the left side, then on the right. Papillitis was diagnosed, and in a fortnight she was blind. Both legs below the knees became painful, anesthesia was demonstrable up to the level to the axillae, and there was paresis of the muscles of the trunk and limbs. More than two months after the onset death followed the development of pneumonia. Scattered over the inner lining of the dura of the cord were numerous white patches, the size of a pin's head to that of a pea, about 1 mm. thick. Some were partially calcified—*arachnitis ossificans*. The cervical cord (second to third segment) was grayish-red, edematous, congested; the boundaries between the gray and white matter were blurred. Traced downwards, the cord showed these

changes with increasing distinctness, and at the level of the first dorsal segment was quite soft, the normal markings being obliterated. Microscopically was seen parenchymatous myelitis and neuritis, with degeneration of nerve fibers and ganglion cells in both the white and the gray matter.

Taft, A. E. ANTERIOR HORN CELLS. [*Am. Arch. of Neur. and Psych.*, Jan., 1920.]

The problem of spinal segment localization. Three of the cases in which cell counts were made on the anterior horns of the spinal cord were those following amputation of an extremity. The other twenty-five had signs of a cord lesion. Variations in the counts between the two sides in the first three was not more than two or three cells in the final average. In two, the greater number was on the side corresponding to the amputation. In the cases without amputation variations in the counts was at times greater than with amputation. In sections where identification was made of right and left side, no uniform difference between the two corresponding counts appeared.

Crouzon and Bouttier. FAMILIAL AMYOTROPHY. [*Bull. de la Soc. Méd. des Hôp.*, Dec. 19, 1919.]

That which the authors give as a new variety of amyotrophy was seen in three sisters between 25 and 32. The first symptoms appeared at 14, 22 and 12 years of age, the older sister is unable to stand on account of the motor and atrophic disturbances. Speech is also spasmodic and panting, hardly above a whisper; reflexes are abnormal, and choreiform movements present.

Herzog, Franz. REFLEX TIME OF THE TENDON AND THE MUSCLE TONUS. [*Neurol. Centralbl.*, April 1, 1918, No. 7, Vol. 37.]

The patellar reflexes were measured according to Hoffmann's method with Edelmann's galvanometer. In measuring the Babinski a special technic was used. Nine cases showing exaggerated tension reflexes as consequence of paralysis of peripheral nerves were carefully examined and are here described. The author says that in all three groups of observations he had the same object, i.e., to determine how the stimulus is communicated from one neuron to another where the mode of communication may have been altered by disease. In the patellar reflexes the problem presents itself in the simplest form, because the paths of the muscle tonus and of the tendon reflex are for the most part identical, consisting of only a few (at least three) neurons. In the author's cases the muscle tonus, as result of various diseases of the central nervous system (diseases which were accompanied by lesions of the pyramidal tracts—*tabes dorsalis*, etc.) was greatly decreased or diminished. The time of the patellar reflexes, however, was found to

be nearly normal, showing that it is not perceptibly changed by increase or decrease of the muscle tonus. In these instances the stimulus passes only twice from one neuron to another. If the path had consisted of a larger number of neurons the change of their function would perhaps become apparent in a change of the reflex time, as result of the transition of stimulus from neuron to neuron. The reflex of the Babinski sign was always longer than that of the normal tendon reflex, being in some cases several times as long as that of the plantar reflex. The reflex path of the Babinski, a skin reflex, is composed of many more neurons than that of the tendon reflex. The long and changeable reflex time of this skin reflex is obviously not due to the length of the nerve fibers, but seems to be due either to the fact that its path is composed of a larger number of neurons, or because the stimulus travels more slowly than in the path of the normal sole reflex, the great difference in time being confirmatory of the view that the Babinski is not a modified plantar reflex, but a pathological reflex wholly independent of it. In the third group there was traumatic paralysis of the peripheral nerves of the upper and lower extremities accompanied by exaggerated reflexes of the same extremities with injury of the paths of the latter. This was observed both in cases where the nucleus of the paralyzed nerve was above the reflex center and where it was below. No increase of muscle tonus was discoverable, so the exaggerated reflexes must have been due to some other cause. The author thinks it probable that, in time, the paralysis of the peripheral nerve destroys the functions of the original cells of the paralyzed motor fibers so that they do not receive the stimuli from the centripetal fibers. It may then be assumed, in the author's cases, that these stimuli react on the cells of the anterior cornua, but owing to changes in the function of these cells the stimuli is not received. Further, it must be remembered that the centripetal fibers of the path of the tendon reflex is not only connected with the nuclei of the muscles controlling the reflex contractions, but also with the lower roots of the motor nuclei of neighboring segments, a fact proved by the circumstance that where there is exaggerated excitability, contractions occur in numerous muscles, which, under normal conditions, do not react. Thus the stimuli from the affected peripheral nerves spreads to other nuclei and some of the stimuli react on the nuclei of the muscles which give rise to the reflex contractions. The author's cases were not, therefore, cases of exaggerated reflex excitability, but due to an increase of stimulus to the muscles. This view is sustained by the observations of others, Babinski, Déjerine, Egger, etc. Exaggeration of muscle reflexes in polyneuritis may perhaps also be explained by the author's assumption that the disease of the neighboring parts causes the stimulus to spread to the intact paths and that the reflex paths receive part of it.

Soederbergh, Gotthard. NORMAL ABDOMINAL REFLEXES AND THEIR MEDULLARY LOCALIZATIONS. [*Neurol. Centralbl.*, April 1, 1918, No. 7, Vol. 37.]

How do the abdominal reflexes behave under normal conditions, when, as far as possible the same technic is used in examinations, and what is the localization of their medullary roots? The author gives an extensive bibliography of previous treatises which, however, he finds unsatisfactory. Too little attention has been given to the finer details connected with the abdominal reflexes; the technic employed is not uniform; the medullary localizations are not definitely determined and their significance explained. He seeks to solve these problems, by setting out with the assumption that if the sensory and motor roots for each reflex are determined, the medullary localization would be given. It is not difficult to surmise where the sensory roots are, as the segments of sensibility in these regions are pretty well known. Further, the author had for years collected observations on the functions of the anterior roots, both from clinical and experimental studies, and in the literature some facts are given which throw light on the motor segmentation. By a minute observation of the abdominal reflexes, especially of the manner in which the various abdominal muscles contract, and by then comparing these results with what was known of the functions of the anterior roots, the motor element of the reflex arcs could be calculated and the circles closed. The author divided the abdomen into four sections corresponding to the epigastric region (epigastric reflex), the hypochondriac region (upper lateral reflex), the region at the level of the umbilical (the middle reflex) and the inguinal region (the lower lateral reflex). Experiments were undertaken on about seven hundred individuals. A summary of the results is as follows: the epigastric reflex manifested itself by a contraction of the superior part of the *angulus epigastricus*; the upper reflex died out above the *infracostal* line; the middle reflex was, as a rule, simple and, in most of the cases, typical—a light ligament-like contraction in the horizontal umbilical line, limited strictly to the *mesogastrium*. The lower reflex showed greater variation than the others; 90 per cent. of the contractions did not go beyond the horizontal umbilical line, in 28 per cent. there was a clearly perceptible contraction of the *obliquus internus*, and, in a few cases, of the *hypogastrium*. The author concludes that the arc of the upper abdominal reflex passes through the sections from D. 6 or 7 to D. 9, and, further, that this reflex may be absent in the upper abdominal syndrome. The localization of the arc of the middle reflex he finds to be from D. 8 to D. 10, and this may be absent in the middle abdominal syndrome. The lower reflex is localized at D. 10 to 12. The fact that the lower reflex may be absent in the lower abdominal syndrome has been confirmed by various writers. Concerning the epigastric reflex, he can express no opinion, besides, it is doubtful

whether it has any diagnostic worth. These localizations are only approximate,* but precise ones cannot be expected without doing violence to nature. The nervous system is not arranged like a desk in which it is possible to find each separate function in a definite place. The reflex muscle contractions, further, do not correspond exactly with those produced by electric stimulation, for the reflex muscle segment is innervated by combinations of some of the fibers of various roots, while the electric stimulus affects only a single root and probably all the fibers of that root. The author calls attention to one other point of interest which he established through experiments with electric stimulation, namely, that the cutaneous reflexes are located several segments further caudalward than the muscle reflexes, conforming with Sherrington's observations.

4. MIDBRAIN; CEREBELLUM.

Widal, F. LETHARGIC ENCEPHALITIS. [Bull. de l'Acad. de Méd., Paris, Jan. 27, 1920, 83, No. 4.]

A peculiar physiognomy is shown in the malady because it seems to affect isolated small patches of the nervous system, passing over the intervening areas. In one case, typical ankle-clonus and the toe phenomenon were the only signs beyond fever, somnolency and ptosis, with none of the other disturbances usually accompanying ankle-clonus.

Halbron, P. ENCEPHALITIS LETHARGICA. [La Médecine, December, 1919, No. 3.]

In a short popular article the writer goes over the outstanding features of the affection to which A. Netter called attention in France in the spring of 1918. He mentions the usual indications characterized by association with an infectious state, more or less complete somnolence and disturbances of the eye musculature. Examination of the cephalorachidic liquid gave only a weak albuminous and cellular reaction; it made possible the diagnosis of encephalitis and of tuberculous meningitis, with which the early cases had been confused. The writer discusses the etiology of the disease, its relation to grippe and concludes with Netter that the disease is a specific ailment. [Author's abstract.]

Morse, P. F., and Crump, E. S. BACTERIOLOGY OF LETHARGIC ENCEPHALITIS. [Jl. Lab. and Cl. Med., Feb., 1920.]

From fluid aspirated from the lateral ventricles of the brain in six cases the authors obtained uniformly pure cultures of a nonmotile coccus, small in young cultures, as large as a staphylococcus in old cultures, with a tendency to grow in diplococcus and tetrad forms and to bunch in small clusters. It divides similarly to a staphylococcus in three planes, stains readily with the aniline dyes, and is gram-positive. Pathologic findings seem to show "encephalitis lethargica" as not a

true encephalitis in the sense that general paresis or the cerebral form of poliomyelitis are said to be, because ganglion and pyramidal cell destruction does not characterize lethargic cases, but it may be classed as a grade "meningomyelitis," the characteristic lesions being in the meninges and white matter of the basal ganglia, pons and upper cord. Cases similar to "encephalitis lethargica" and called by him "acute multiple sclerosis," were described by Marie, in 1890. Morse and Cramp feel that this term has much to justify its use both pathologically and clinically.

Hala, W. W., and C. M. Smith. MENINGO-ENCEPHALITIS. [Am. Arch. of Neurology and Psychiatry, Feb., 1920, pp. 160-169.]

The case is one clinically diagnosed as Encephalitis Lethargica, verified by observations, antemortem and postmortem, and is interesting because it displayed not only the characteristic histopathologic brain lesions observed by others, but also on account of the intense purulent meningitis and ependymitis found at necropsy. The etiological factor was a Gram neg. motile bacillus isolated both ante- and postmortem. It occurred in a male, aged thirty-one years, with an antecedent history of an influenzal attack a week before admission to hospital. The chief complaint was malaise, headache and drowsiness. After several days rigidity of neck and increasing drowsiness became evident. Ptosis of both eyes was first noticed three days after admission, with irregular contour of right pupil. Reaction of pupils to light and accommodation was normal until a week after admission, when they became immobile. Horizontal nystagmoid movements were pronounced, with evidence of paralysis of the external rectus. Patient then developed incontinence of urine and dysphagia, necessitating catheterization of bladder and feeding by stomach tube. Complete paralysis of left facial muscles, of left external rectus, deviation of tongue to right and paralysis of constrictors developed on the eighth day after admission. Patient, then in complete lethargy, died of pulmonary edema on this day.

Temperature varied from 101° F. to 105° F. There was no relation between pulse rate and temperature.

Laboratory Data: Urine: Sp. gr. 1.024; trace of albumin; hyaline casts. Blood: Polynucleosis; white count 24,000; Widal and Wassermann tests negative; blood urea 34 mgms.; blood sugar 0.12 per cent.; blood cultures negative; spinal fluid, cell counts varying from 480 to 12,000 per cmm., 85 per cent. to 90 per cent. polys; Lange's Test showed

meningitic curves—⁰⁰⁰⁰¹³²²¹⁰
0000111100. Bacteriological examination was negative until day before death when a Gram neg. motile bacillus was isolated from fluid. *Necropsy:* Congestion and edema of lungs, lobular pneumonia, septic spleen, cloudy swelling of liver, acute nephrosis of left kidney, cystic remains of right kidney, old encysted subdural hemorrhage, acute exudative meningitis of brain and cord, acute encephalitis,

acute ependymitis; petechial hemorrhages in corpus striatum, optic thalamus and centrum ovale. *Microscopic Findings:* A Gram neg. bacillus demonstrated in purulent exudate of both brain and cord, and in exudate of ependyma of ventricle. Perivascular round-cell infiltrations and petechial hemorrhage of centrum ovale, optic thalamus and corpus striatum. The bacillus isolated antemortem in spinal fluid and from exudate at time of autopsy was 8μ long, slightly motile, Gram. neg.; acidified glucose, mannite, galactose and levulose, but produced no gas in any sugars. Animal injections caused death in from three to seven days; peritonitis and generalized septicemia, but no invasion of cerebro-spinal axis. The bacillus was placed tentatively in intermediate class of the colon typhoid enteritidis group. The case clinically was one of meningo-encephalitis with lethargy and involvement of motor fibers of 3, 6, 7, 10 and 12 cranial nerves. The etiologic organism was an unidentified Gram neg. motile bacillus. Pathologically the lesion demonstrated septic meningo-encephalitis and ependymitis with punctate hemorrhages and perivascular cell infiltration of centrum ovale, corpus striatum and optic thalamus. [Author's abstract.]

Sabrazes, J., and C. Massias. LETHARGIC ENCEPHALITIS: ABORTIVE FORMS. [Gaz. hebd. d. Sci. Méd. de Bordeaux, Feb. 8, 1920.]

Three more cases are given by these authors. In two the clinical picture was complete, but the symptoms of very short duration. In the first the fever and ocular symptoms lasted only a few days and the attack was so mild that the patient did not stay in bed. The second was also one of ambulatory lethargic encephalitis. The third had fever and somnolence but no ophthalmoplegia; the disease lasting about a fortnight, leaving the patient in a debilitated condition.

Klessens, J. J. H. M. NERVOUS COMPLICATIONS OF INFLUENZA. [Nederlandsch. Tijdschr. v. Geneeskunde, 1919, No. 14, II.]

The epidemic of influenza (Nov. and March, 1918/19) caused many affections of the peripheral nerves; the prognosis of these neurites is favorable, the aspect however, especially the atrophy of the muscles, is severe. In all the cases observed perfect cure of the atrophied muscles was obtained. These cases were: paralysis of the serratic muscle ($2\times$), neuritis of the ulnar nerve, and neuritis of the inferior brachial plexus without oculo-pupillar symptoms but with extensive atrophy of the small muscle of the hand; neuritis of the ischiadical nerve with paralysis of the peroneal muscles.

Although not so frequent, in affections of the peripheral nerves it often occurs especially in the lighter forms of influenza, that in the central nervous system encephalitic inflammations are the cause of local cerebral symptoms. It is evident that in the affection of the brain these sufferers must be handled very carefully, especially as these

encephalitic infiltrations appear readily in the neighborhood of the medulla oblongata; the patient showed lesions of the medulla oblongata (nystagmus, vertigo, paresthesias all over the body, symptoms of irritation of the Vagus nerves, bradycardia, and numbness of the skin around the meatus acusticus externus); another patient had signs of encephalitis pontis (paresis of the left leg, clonus of the feet), the knee and Achilles reflex were exaggerated, there was hyperalgesia of the skin innervated by the fifth nerve. A third patient showed symptoms of a neuritis of the eighth nerve (vertigo; he falls backward when the eyes are closed, the position of the head determines the side to which the falls).

Another observation regards a myelitis of the right cervical intumescence together with the remains of an old neuritis of both peroneal nerves caused by typhoid fever. (The reaction of degeneration in the small muscles of the hand was perfect, and the reflexes on the same leg were exaggerated, etc.) The following is an observation on a patient showing only affection of the cells of Purkinje in the cerebellum.

Girl, 8 years old, had influenza; as the fever ceased, she could not walk or balance herself. At first she could scarcely stand on her legs, later, while she stood she always fell backward. There was a light nystagmus and a clear dysdiadochokinesis on the left side. The reflexes were normal. There was no ataxia in the arms, nor in the leg. The fundus oculi was normal, there were no pareses, nor disturbances in the sensory functions. At first the child could not talk at all, later on she could only talk with great difficulty. Keeping the child quietly in bed, and feeding her on strengthening and in the main lacto-vegetable food, she improved slowly. She also learned to walk by training. The static ataxia and dysdiadochokinesis disappeared in some eight weeks, and talking is now perfect. These symptoms: nystagmus, difficulty of speech, static ataxia and dysdiadochokinesis without other affections form a complex that shows a lesion of the cerebellum. The conformity with a patient, whom Brouwer described, is exact. In his case only the cells of Purkinje were destroyed, the other cells of the cerebellum were well conserved. The clinical symptoms in this case so resembled the case just mentioned, that it is very likely that in this girl only the cells of Purkinje were affected. In Brouwer's patient, the intoxication was caused by toxins of a tumor cachexia; in this case the influenza toxin caused destruction of the Purkinje cells.

Analogous affections are described in chronic alcoholism (Fickier, Bielschowsky) which agree with the olivo-cerebellar type of Déjerine-Thomas or with the olivo-rubro cerebellar type of Lejonne and L'Hermitte. Selective intoxication of the Purkinje cells is also described by Dehio by experimental intoxication with alcohol in rabbits. The symptoms of drunkenness and delirium tremens conform neurologically very closely to an affection of these cells, and in patients suffering from

delirium the Purkinje cells are destroyed as well as the pyramid-cells in the cortex cerebri.

An observation by Thomas of a luetic woman, with, in the main, cerebellar symptoms but with other complications also, must in this context be mentioned (deviation in walking, static ataxia, anomalies of speech, hypotonia, etc.). Microscopical examination showed that the Purkinje cells were locally nearly destroyed; in the molecular and granular layers there were only slight destructions. Thomas named this affection an "atrophie lamelleuses des cellules de Purkinjé" and similar affections are described by Rossi, Fickler, Murri.

In this case the luetic toxin was the cause of the destruction of the Purkinje cells, as the influenza toxin was the cause in our patient. The intoxication of those cells is separate; in the alcoholics the convalescence is rapid, in influenza, slow, the intoxication not so diffuse. Two other patients showed an affection of the cerebellum, but in these the static ataxia was the most important symptom, together with difficulties in the speech. [Author's abstract.]

Grosz, K. LETHARGIC ENCEPHALITIS. [Wien. klin. Woch., February 26, 1920.]

Among other cases, the author describes the post-mortem of a patient, aged 35. The first symptoms were headache, giddiness, weakness, and paresthesia of the right arm and leg, and paralysis of the left abducens nerve. Ptosis and somnolence supervened, the latter growing more intense during an illness of four months. At necropsy were seen marked infiltration of the blood vessels of the brain with mononuclear cells. In several places this infiltration had extended to the parenchyma which in some parts was involved quite apart from the infiltration of the blood vessels. There were also signs of neuronophagia, and the ganglion cells showed severe degenerative changes; a few perivascular hemorrhages were present. The distribution of the morbid changes in the central nervous system was very irregular, and scarcely any infiltration of the spinal cord. All his cases showed symptoms conforming to the type of encephalitis lethargica as defined by Economo.

Farquhar Buzzard, E., and Greenfield, J. G. LETHARGIC ENCEPHALITIS. [Brain, 1919, xlii, Part iv, p. 305.]

This work contains a recapitulation of the contents of two papers published by Farquhar Buzzard on the same subject in the *Lancet* (Dec. 21, 1918) and in the *Proc. Roy. Soc. of Medicine* (London, No. 9, Aug., 1919), to which the results of some more recent investigations and a description of the morbid anatomy of the disease have been added. The conclusions arrived at are drawn from a series of 22 cases, 5 of which were followed by autopsy, as well as from the material of some other cases not included in the series and obtained from a variety of

sources. From the clinical standpoint the authors emphasize the fact that the diagnosis of lethargic encephalitis can never depend on the presence or absence of any symptom or group of symptoms, but must be determined by a consideration of the onset and course of the disease and by the elimination of other pathological conditions which may produce similar symptoms and physical signs. Without attempting a description of different types of the disease dependent on the anatomical incidence of the inflammatory process, the authors point to 3 groups of cases with characteristics sufficiently distinct to merit consideration. (1) Cases characterized by hemiplegia, hemianesthesia, hemianopia, etc. (2) Cases characterized by symptoms resembling those of paralysis agitans; the basal ganglia group. (3) Cases characterized by disturbances of function of the cranial nerves. These three groups correspond to different anatomical levels of the brain, and suggest the chief incidence of the inflammation in each, "though both clinical and pathological investigations show that the disease is always more widespread than might be suspected from the most prominent symptoms. The detailed observations made by the authors afford a good illustration of these general remarks. So far as the prognosis is concerned they point out that further experience may teach us more about it and that at present one can only say that a certain number of cases die either from toxemia or hemorrhage in the acute phase of the illness, or from some complication following it, while others recover completely, and some survive the acute stage but carry with them in after-life permanent defects due to the morbid process such as involuntary movements, some degree of hemiplegia or diplegia. As to treatment, the authors cannot point to any method likely to abort or cure the disease. The experience of four cases suggests that operative intervention in the way of decompression is really contraindicated in spite of the presence of increased intra-cranial tension. Indeed, in three of these patients death was caused partly from hemorrhage, and "it is hard to believe that decompression can be beneficial when this hemorrhagic tendency exists." The pathological and histological findings in fatal cases have been identical with those described by former authors and consisted, briefly summarized, in: Vascular congestion; toxic degeneration of the nerve cells and neuronophagy; proliferation of the mesoblastic cells of the vessel walls with infiltration of the nervous tissue by these cells; small celled infiltration of the Virchow-Robin space; glial proliferation. Venous thrombosis and hemorrhage were also observed, though the authors think that neither of these phenomena are constant in the disease, at least in the cases they have examined. Venous thrombosis was found to affect either the largest veins on the cortex or the smallest venules in the substance of the brain or brain stem. Hemorrhage seemed to be due to two distinct causes: The commoner form was that where a smaller or larger ring of blood corpuscles surrounded a congested vessel with occasional breaking into the nervous tissue for some distance from

the vessel. The other form was due to infraction consequent to thrombosis of an artery. The hemorrhages in this case seemed to have taken place from small arterioles and to have occurred at much greater pressure than in the previous form. [Da Fano.]

5. BRAIN; MENINGES.

Bauza. FROIN'S SYNDROME AND TUBERCULOUS MENINGITIS. [Rev. méd. de Uruguay, Oct., 1919.]

A boy, aged 4 years, developed symptoms of meningitis which on lumbar puncture showed a yellowish fluid, which coagulated *en masse* in a few minutes; it contained 25 cells per cubic millimeter, lymphocytes 100 per cent., normal and changed red cells, and an increase of fibrin. There were no tubercle bacilli, but a few meningococci. A second puncture yielded only a few drops of fluid, which set in a jelly. Inoculation of a guinea-pig did not produce tuberculosis. The case, however, was regarded as an example of tuberculous meningitis, owing to a positive intradermal reaction with a meningococcal association.

Fossatara, E. MENINGITIS SYMPTOMATOLOGY. [Policlinico, Dec. 7, 1919.]

A man of 37 suddenly began to cough and expectorate, following fever, headache and vomiting. Râles were found. The neck was stiff. Meningococci were found in the spinal fluid. The course was distinguished by torpor and death at the third month. The spinal meninges did not seem to have been affected. There was loss of equilibrium sense and a tendency to fall which suggested a tumor in the cerebellum but vision was normal and no eye ground changes. The torpor was the result of the hydrocephalus. Purulent leptomeningitis of the lower surface of the cerebellum with hydrocephalus, ventricular and also intermeningeal were found.

Villaret, M., et al. ALCOHOLIC MENINGITIS. [Bull. de la Soc. Méd. des Hôp., Dec. 19, 1919.]

In the woman of 45 typical symptoms of meningitis were present. The presence of syphilis and tuberculosis could be excluded. The diagnosis was made from the findings of alcohol in the cerebrospinal fluid.

Lewkowicz, K. SEROTHERAPY AND VACCINE OF EPIDEMIC MENINGITIS. [Arch. de Méd. des Enfants, Dec., 1919, J. A. M. A.]

Lewkowicz presents what seems to be conclusive clinical evidence that the lateral ventricles are the principal and essential seat of the infectious process, and that the meningococci spread from this hotbed through the entire subarachnoid space. The antiserum therefore, he declares, should be injected into the lateral ventricles from the very first and be reinjected daily, on alternate sides, or simultaneously on both

sides every third day. The amount of the antiserum should be from 10 to 20 c.c. He urges the use of vaccine at the same time, from the very start. This tends to induce a general immunization which is a potent aid in the cure. He punctures the skull with a Götze grooved drill, 15 mm. wide, in a hand-drill. The needle is 1 mm. in diameter and 7 or 7.5 cm. long. A brass guide for the needle is introduced through the groove in the drill before the latter is drawn out. The brass guide inside the needle prevents obstruction with tissue. The tip of the needle is not sharp, as the only obstacle it has to force is the dura. The puncture is made anywhere along the top of the skull, 3, 4 or 5 cm. from the median line, pointing the tip of the needle toward the center of the skull. The depth of the puncture should be about 40 mm. for infants; 50 to 60 mm. for older children, and 60 to 75 mm. for adults. The fluid should not be injected until the needle is certainly in the ventricle. This is proved by the cerebrospinal fluid flowing from the needle and by the drop in tension as the antiserum spreads in the ventricles. It is important, therefore to have a manometer with three-way stopcock interposed between the needle and the syringe. The tension should not surpass 60 to 80 mm. mercury for older children and adults, and 40 or 50 for infants.

After the injection he leaves the needle in place for ten minutes to let the tension fall. Then he draws the needle half way out and leaves it for fifteen or thirty minutes, by which time the puncture canal has been plugged with a clot and there is no further oozing. In renewing the injections he trephines always at a point 1 or 1.5 cm. at least beyond the last points. His mortality was 36 per cent. in his last series of twenty-two cases, but analysis shows that a defective antiserum or a fulminating course from the start explained all the fatalities. In one instructive case the antiserum displayed a notably favorable action up to the twelfth day. Then the following injections, the sixteenth and seventeenth days, induced anaphylactic phenomena. Hence he warns not to give horse antiserum for longer than the thirteenth day, relying on the vaccine used from the start to carry on the work. In some mild cases the vaccine alone proved effectual, the blood serum showing an antibody content equal to that of the commercial antisera. He explains how there is a constant current from the ventricles to the surface of the brain and of the spinal cord, the ventricles being the secreting area and the subarachnoid space the resorbing area. He has been applying this primary ventricle serotherapy since 1914, and has a total record of eighty-four cases.

Roger, H. UREMIC MENINGEAL SYNDROME. [Ann. d. Méd., Dec., 1919, J: A. M. A.]

Roger presents evidence to show that the meningeal reactions which develop in the course of uremia do not seem to be directly caused by the retention of nitrogen. They are usually the results of intercurrent cere-

bral complications, hemorrhage and softening, for which the kidney sclerosis is only indirectly responsible. Cerebral hemorrhage was found by Frerichs in 11 of 292 uremia cadavers, and 3 in 112 by Rosenstein. Canti has recently published 3 cases of cerebral hemorrhage or softening with azotemia of 0.9 to 1.5 gm. per liter. Meningeal hemorrhage is not exceptional with chronic kidney disease. The latter raises the blood pressure until some vessel ruptures. This explanation of the meningeal reactions in uremia is mechanical rather than toxic, would be verified oftener if the cerebrospinal fluid was examined more carefully at necropsies. Slight xanthrochromia may escape detection unless the tube is inspected lengthwise, but this proves the presence of blood, thus adding a fourth type to the three biologic types of uremic meningeal reactions, those with hyperalbuminosis, those presenting merely hypercytosis, or both combined. Acute infectious meningitis in a patient with uremia is often mistaken for uremic meningitis. The pneumococcus is usually involved, but syphilis and tuberculosis may likewise be responsible. In one such case, with positive Wassermann reaction, the convulsions subsided after lumbar puncture, but the headache and torpor did not improve until under treatment for syphilis. When the uremia alone can be incriminated for the meningitis or meningeal condition, the spinal fluid may show merely cytologic and chemical reactions without clinical manifestations, or these reactions may be encountered in the course of neuro-uremia, febrile or not, with headache, vomiting, convulsions, stiffness of the back of the neck, Kernig sign and contracture of the spine. But Roger insists that most of these symptoms are the work of the azotemia rather than any special injury of the meninges. The urea poisons the cortex. He had one case in which extreme retention of sodium chlorid alone, without uremia, was responsible for convulsions, etc. To prove the various points in his article, he cites numerous concrete examples from his own and others' experiences.

Haden, R. L. MENINGITIS. [Arch. Int. Med., Nov. 19, 1919.]

Haden in thirty-one cases of meningitis had twenty-one, or 67.7 per cent., which showed evidence of a generalized infection previous to the localization in the meninges. The mortality of the entire series was 22.6 per cent. During the period of intraspinal treatment alone, and combined intraspinal and intrasubcutaneous treatment, the mortality was 37.5 per cent.; during the period in which intraspinal and intravenous therapy was employed, the mortality was 6.6 per cent. One case in which an active localized infection in the meninges recovered under intravenous therapy is reported.

Lecène, P., and H. Routtier. PROGNOSIS IN CRANIAL TRAUMATISM. [Presse Méd., Nov. 12, 1919.]

Extensive clinical experience during the war makes these authors urge that serious attention should be paid, in the prognosis of cranial

traumatism, to a pathological state which corresponds neither to an extensive local focus of traumatic encephalitis nor to a meningoencephalic infection, but to diffuse brain lesions of concussion—"commotional"—origin. More or less prolonged unconsciousness, followed by a stage of mental confusion and disturbed tendon and skin reflexes, either diffuse or localized in one segment of the body attend pure brain "commotion." There may be disturbances of vascular tone and of muscular tonicity, the latter at times confirmed by electrical tests. Finally, there are psychic reactions and subjective disturbances the organic nature of which may be shown through the abnormal response of the patient to induced vertigo. Lumbar puncture in these cases revealed many instances of abnormal histochemical conditions in the cerebrospinal fluid. Commotional lesions in the brain itself were found by postmortem histological examination. The prognosis is always difficult, both as regards the immediate vital prospect and the ultimate effects. The observed existence of minute histological lesions in the brain doubtless accounts for the importance and chronicity of certain mental disturbances met with following diffuse traumatism of the brain.

Kreider, N. CRANIAL DEFECT. [Journal A. M. A., Ap. 10, 1920.]

As the result of a kick by a horse, a boy sustained a compound fracture of the frontal bone above the left eye. The fissure in the bone was about 3 inches long, and 1 inch broad, running down at each end to a point. Two large pieces of bone were indriven, causing loss of considerable brain substance. The author, under ether anesthesia, removed about six pieces of the bone. The two large fragments were inserted in a pocket, which was prepared in the left hypochondriac region, and made by slightly curved incision, nearly 3 inches long. The two pieces of skull bone were completely buried, and the incision was closed. The wound in the frontal region was thoroughly cleansed, a pledget of iodoform gauze was inserted in the cavity, and the edges of the wound were brought together, except at the ends. Six weeks after the injury was sustained the two fragments of bone were taken from the pocket and placed exactly in their former positions. A considerable layer of fat had become fastened to the outer side of these bones during their sojourn in the abdominal wall, and this was utilized in sewing them in place with fine catgut. The large scalp flap was then brought over, completely closed with silkworm gut, and a firm dressing applied. The result in this case has been perfect recovery. Kreider points out that the implants should be placed in the hypochondrium with the outer surface of the bones in contact with the fatty tissues in this region. When they are removed, as much of this fatty tissue as possible should be brought out with the bones. When they are replaced, this tissue should be sewed with fine catgut to the epicranial aponeurosis and the implants secured in place.

6. BRAIN.

- v. **Haberer, Hans.** CONTRIBUTION REGARDING OPERATIONS FOR UNUSUALLY LARGE BRAIN TUMORS. [*Archiv f. Psych.*, 1919, Vol. 59, p. 615.]

The author reports three successful operations for very solid tumors whose size could not be determined beforehand. In the first two cases the localization was somewhat similar, although one was in the right hemisphere (gyrus angularis) and the second in the right (gyrus supramarginalis). Affections in both these convolutions soon lead to destruction of the optic radiations, and thus all the boundaries of the tumors could be determined except the posterior one, for when hemianopsia occurs there are no further symptoms to indicate how far the tumor extends backwards. In the first case only the principal part of the tumor could be extirpated at the first operation and other parts had to be taken out in separate pieces. In the second case the entire tumor was removed in a single mass. It was of the so-called "epicortical" character, extending from the pia mater into the deeper parts; in the first case the tumor extended into the medullary substance, but probably also originated primarily in the pia; it was a sarcome, a fact which clouded the prognosis, though malign growths in the brain, if carefully extirpated, are known to be less harmful than in other regions. In both cases there were no ill results in the form of motor impairment resulting from mechanical injuries. The opening was made on one side only, because the author did not know that the tumors were so large. In both cases the symptoms due to the tumors, including the optic disturbances, in time receded. The third case was that of a twelve-year-old boy who was operated on under local anesthesia. In trephining the central sulcus was in the center of the area opened and this area extended four centimeters posteriorly and anteriorly, the base being two fingerbreadths above the upper ear muscle border, and the upper boundary being near the median line. A cyst was found, of echinococcus unilocularis character. The anamnesis showed that the boy, son of a forester, had been in the habit of fondling dogs. The post-operative course was ideal. These two successful extirpations which were performed with opening on one side only are evidence that the sudden removal of pressure can not be regarded as the only danger from excision of tumors with an opening on one side of the skull.

- Böhmig, K. H.** BRAIN TUMOR IN A BROTHER AND SISTER. [*Archiv f. Psych.*, 1919, Vol. 59, p. 527.]

In the literature on the subject, the author knows of only one observation (Besold's) of cases of brain tumor in collateral relatives springing from the same parentage. He therefore communicates an observation which he met with in his experience. A brother and sister both died of brain tumor. In the brother's case there was a glioma of

the left frontal and parietal lobes with formation of cysts. In the sister's, a large edematous glioma in the right frontal lobe. Too little is known concerning the etiology of brain tumors to permit conclusions to be drawn concerning the cause of the disease in two members of the same family. The father of this brother and sister died of paresis.

Friedman, E. BRAIN TUMOR. [N. Y. Med. JI., Nov. 8, 1919.]

Friedman reports two cases of brain tumor in which the diagnosis was confirmed by autopsy.

The first was a tuberculoma of the pons. The patient complained of occipital headache for a number of months. There was diplopia, vertigo, and right-sided hemiparesis. Most recently there was difficulty in deglutition and speech defect. The patient had a tendency to fall to the right. The physical examination showed choking of the disc on the left engorgement of the veins on the right, paralysis of the left sixth, drooping of the right angle of the mouth, spasm in the left platysma, deviation of the tongue to the right, right hemiparesis. Some time later patient developed nystagmus with rapid oscillations to the right, percussion tenderness of the skull. The blood Wassermann was negative. The patient died three months later of miliary tuberculosis and at the autopsy the clinical diagnosis of tumor of the left half of the pons was confirmed by the presence of a solitary tubercle in this region. The curious feature of the case was the absence of sensory changes.

The second case was that of a man who while at work had a dizzy spell without loss of consciousness. Fifteen days later he suddenly lost consciousness for an hour and showed aphasia. These attacks of vertigo occurred repeatedly for about two weeks. There was no headache, vomiting or impairment of vision. Physical examination showed some loss of power on the right side, complete sensory paralysis including the cornea, astereognosis, exaggeration of deep and diminution of the superficial reflexes; negative blood and spinal fluid, and nothing in the fundus. The rest of the physical examination showed no abnormalities. Blood pressure was normal, X-ray examination of the skull showed a large sella. The diagnosis of progressive cerebral thrombosis was first made. Two months later patient developed headache, vomiting, aphasia, alexia, agraphia and a blurring of the disc outline on the left. There was distinct percussion tenderness of the parietal region on the left. The pulse rate was fifty per minute. The original diagnosis was now changed to that of brain tumor probably subcortical in the parietal lobe. Patient was then transferred to one of the hospitals where a diagnosis of frontal lobe tumor was made. Exploration was made in that area but the tumor was not found. Patient died a few days later and the autopsy revealed "a primary subcortical neoplasm in the left parietal region. Microscopic examination showed perithelioma." The localization was based on the persistent astereognosis, the sensory changes, the absence of cor-

tical epilepsy, the transitory character of the aphasia and the mild motor phenomena. The association of alexia, agraphia and aphasia was thought to be due to lesion of the subcortical association tracts. [Author's abstract.]

Medea, E. CASE OF TUMOR OF THE POSTERIOR CRANIAL FOSSA. [Atti. Soc. Lomb. Sc. Med. e Biol. Milano., 1919, viii, 39.]

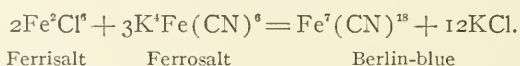
As shown by the post-mortem examination a large endothelioma had grown between the right occipital lobe of the cerebrum and the superior surface of the right cerebellar hemisphere. The case is interesting because all through life there were only symptoms of increased intracranial pressure, hence the possibility in similar circumstances of a mistaken diagnosis of meningitis serosa (acquired hydrocephalus of the adult). [De Fano.]

Medea, E. CASE OF REMOVED CEREBRAL TUMOR. [Atti. Soc. Lomb. Sc. Med. e Biol. Milano., 1919, viii, 23.]

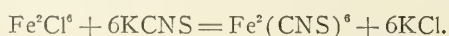
Clinical account of the removal of a very large endothelioma of the left Rolandic area. The neurological interest of the case lies in the fact that all through the course of the clinical observation the tumor never gave any sign of an increased intracranial pressure. [De Fano.]

Landau, E. CHEMICAL DIFFERENTIATION OF BRAIN TISSUES. [Archives Suisses de Neurologie et de Psychiatrie, Vol. V, 1919.]

It is well known that a mixture of ferrisalt with ferrosalt produces a blue sediment of so-called Berlin-blue according to the formula:



Researches by Guizzetti showed, that if a cut of fresh unprepared brain is placed for an hour into a solution of ferrozyankalium of 2 per cent. and then this cut is transferred into chlorid acid of 1 per cent. that after a few minutes the globus pallidus is painted sky-blue to dark-blue, while the putamen as well as the whole cortex remain colorless. Our pupil, Czermak, has reexamined these experiments and confirmed them. Guizzetti draws from such results the conclusion that the globus pallidus (also nucleus ruber and substantia nigra) must contain iron salts. How would it be, we asked ourselves, if iron salts could be added artificially to the cortex as well as to all the basal ganglions? It is evident that, if anything of the kind could be done, we should have found a method of dyeing all the gray putamen, as well as the cortex by chemical process, that is, by ferrosalts blue, or red by rhodanammonium, eventually rhodankalium, after the formula:



This we have actually succeeded in doing, by putting undyed brain cuts for a few minutes up to an hour into a weak solution (1 per cent. to 2 per cent.) of ferrum sesquichloratum (Fe^2Cl^6), and from there after rinsing, into rhodanammonium or into ferrozyankalium. The blood-red rhodan coloring of the cortex and the ganglia is very beautiful, but this salt is unfortunately readily soluble in water, by which the dyeing does not keep, but the blue of Berlin reaction is much more lasting. By making the solution of the two iron salts (ferro and ferrisalts) more or less weak, the intensity of the blue coloring can be influenced. The marrow, the white substance, remains nearly completely colorless. Should it be proved that a cut of brain appears too darkly colored, contrary to our wishes, or not plastic enough, yet such a preparation is not to be considered as lost, as would be the case by its being dyed by color, for the produced Berlin-blue can, as we found out, easily be made to disappear by ammonia. A preparation bleached in such manner can, after a thorough rinsing in running water, again be brought into the different iron salts to be dyed anew, and this so often, till the desired result is accomplished. By adding some chlorid acid the Berlin-blue reaction may be deepened. [Author's abstract.]

van Valkenburg, C. T. ON VERTICAL LOCALIZATION IN THE CEREBRAL CORTEX. [Proceedings of the Netherland Medico-physical Congress, 1913.]

Experimental and pathological findings on the relative interdependency of the upper and the lower layers in the cortex of the brain. Beyond the well-known relation between the deeper layers and the long corticofugal (and perhaps corticopetal) fiber systems, the author states the origin of the callosal fibers in the deeper, their ending in the superficial part of the cortex (Brain, 1913). Pathological and experimental evidence is given on which to base the conclusion that the cortex layers may represent superposed physiological mechanisms, with to a certain degree—an intrinsic organization. [Author's abstract.]

Notes and News

ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASES

The first annual meeting of the Association for Research in Nervous and Mental Diseases will be held during the Christmas week of 1920 in New York City. The subject for discussion will be "The Acute Nonsuppurative Infections of the Nervous System." The exact date and place of the meeting will be announced in the December number of the JOURNAL and full particulars, including the program, will then be published.

The secretaries of all interested neurological or psychiatric societies may obtain the necessary blank forms for membership application from the Secretary-Treasurer, Dr. Foster Kennedy, 20 West 50th Street, New York City. As before stated, all members in good standing of any neurological or psychiatric societies are eligible to membership in the Association for Research in Nervous and Mental Diseases on payment of the annual fee of \$5.00. This fee entitles the member to a copy of the transactions which will be published by the Commission of the Association after the meeting.

Book Reviews

Kretschmer, Ernst. DER SENSITIVE BEZIEHUNGSWAHN. EIN BEITRAG ZUR PARANOIAFRAGE UND ZUR PSYCHIATRISCHEN CHARAKTERLEHRE. Monographien aus dem Gebiet d. Neur. u. Psychiatrie, Heft 16, Julius Springer, Berlin.

This is a monograph of 166 pages from one of Gaupp's assistants in Tübingen. It deals with an important topic, the general paranoia problem, and from a purely descriptive standpoint does it admirably. At the same time the work would offer a description of a nosological entity, a special type of psychopathy the "Sensitive Beziehungswahn," the main features of which we shall later attempt to summarize.

He begins his study with Wernicke's conception of a circumscribed autopsychosis on the basis of overvalued ideas, which while it proved very useful in getting outside of the then prevailing English and French conceptions of the monomanias had its great limitations as well. He then develops his theme along the orthodox lines of Jasper's psychopathology with a rather light résumé of the development of our notions concerning "ideas of reference."

This leads to a second chapter, "Psychiatric Character Study," one of the most fascinating and active fields in modern-day psychopathology. In the author's hands it starts promisingly. He acknowledges the difficulties; speaks of the inadequacies of our present-day concepts to encompass the many-sided and intricate phenomena to be handled, but disappointingly, after enunciating the need for a definite dynamic aspect, falls back upon the method of a descriptive psychology, chiefly of conscious phenomena. He spins a beautiful dialectic. "Wir werden also versuchen, die *feinfarbigen sprachlichen Ausdrücke* für Charaktereigenenthümlichkeiten so ein *solides logisches Gerüst* einzufangen, das jeder darin einen festen Platz hat, ohne dadurch seinen Duft zu verlieren." This is the typical intellectualistic program, "a solid logical framework" which too often loses the living function by exclusion and application to the study of the dead structure.

Let us see how successfully he does it. He begins by laying down definition of the definition—purely formal, sometimes individualistic, sometimes this author's statement, sometimes that.

We find many of the old familiar standbys. Weight is laid upon the old conceptions of tonic and atonic, here called sthenic and asthenic, as indicative of the "psychic force" of Lipps. The absolutistic concepts "normal" and "abnormal" also play a large part in development of the author's definitions. For the pragmatic dynamist naturally these

concepts are of no particular service. It must be said the author is not entirely satisfied with these but nevertheless uses them throughout his discussion. This is quite evident in his ideas of the compulsion mechanisms concerning which he says that parallels between his characterological observations and those of the psychoanalytic school are so evident that they can compel a formulation along psychoanalytic lines, but the author hastens to add that whereas the psychoanalytic data cannot be impugned he nevertheless fights shy of the point of view which has revealed them. He thus, logically speaking, seems to lose sight of the method by which hypotheses function, especially when he says that Freud as "theoretiker" and as "therapeuten" must be separated. Thus a theory must be separated from the facts which it pragmatically reveals. One might illustrate this by saying the facts revealed by the telescope or microscope, may be quite correct but the optical theories [for microscopes and telescopes are after all only theories of optics] must be neglected. Even then the defect of logic must have appealed to the author, for he says it has been a great detriment to psychiatry that the ruling schools have neglected the psychoanalytic viewpoint. Having said it, however, he forgets all about it and goes on with the sterile dialectic of the reigning schools.

A third chapter deals quite extensively with the erotic ideas of reference of old maids, in which the intellectualistic habit of using words for things is unnecessarily spun out. Masturbation ideas of reference, as characteristic of the sexual neurasthenic (whatever this may mean) is the theme of his next chapter. Case histories are given to illustrate the various terms the author uses. Since they are all at the purely conscious level they offer little that is useful. The next chapter on "Occupation Conflicts" is treated at about the same level as is also the chapter on "Compound Characters."

In his last chapter the author presents a synthesis in which he says the "Sensitive Beziehungswahn" constitutes a definite disease group which may be characterized by a definite etiology, symptomatology and course. Etiology: (1) Originates chiefly on severe hereditary basis; (2) biologically characterized by ready fatigability from work or affects; (3) the real motivation, however, is a type of psychological reaction compounded upon character, experience, and environment. The character is "Sensitive." Asthenic. Emotional softness, readily wounded with marked conceit. Experience prevents these individuals from getting themselves over. The social constellation is unfortunate. As far as the symptoms go, (1) the content of ideas and the affective reaction are concentrated upon the pathological experience; (2) the symptoms of the sensitive psychosis make up an exaggerated working out of the sensitive character foundation; (3) the whole picture is often tinged with neurasthenic exhaustion coloring.

The course is on the whole benign. The early and mild cases rarely

are seen by psychiaters. Severe cases are known which have a chronic course—six years or so—and make up a group the so-called “abortive paranoias.”

Even this somewhat lengthy review hardly does justice to the author's very painstaking effort to separate out from the mass of suffering humanity a special reaction type. We believe his work to be praiseworthy but a great misapplication of effort from affective blocking. This makes it practically useless in an intrinsic sense as the day for a psychiatry at purely conscious levels has gone by. It belongs with the anecdotal phases of animal behavior studies, or with the natural history romantic stages of botany or zoölogy. It is camouflage psychiatry. A psychiatry which does not interpret, no matter how complex the symptoms, into terms of individual craving adjustments—that deals with symptoms as such, rather than as more or less highly elaborated symbolic modifications of bodily functions—we believe is not really entitled to be called psychiatry. It is a type of scholastic diplomacy functioning to maintain certain social institutions, at levels high enough for the mass that can use them but still running in old comfortable channels.

JELLIFFE.

Krisch, Hans. DIE SYMPTOMATISCHEN PSYCHOSEN UND IHRE DIFFERENTIALDIAGNOSE. Abhandl. a. d. Neurol., Psych., Psychologie u. ihren Grenzgebieten, No. 9. S. Karger, Berlin.

These new “Abhandlungen” were started during the war period and this is the first of the series edited by Bonhoeffer to receive notice in these pages. Others which may later come to the editor's desk will receive attention.

Krisch is assistant in Schroeder's Klinik at Greifswald. His chief and Bonhoeffer, as may be remembered by some of our readers, published a large monograph on the Symptomatic and Intoxication Psychoses in Aschaffenburg's Handbook of Psychiatrie. Thus the present small monograph of approximately seventy pages follows the lines laid down by the monograph cited.

The subject matter is concerned with those psychotic symptoms which may be the direct results of infection or intoxication, or accompany some marked somatic defect. Insofar as many are of very mild character, or conceived as such, it is a difficult field. The earlier studies are taken up in a chapter on theories. Kraepelin laid much emphasis upon the hope that not only could there be a general infection syndrome but that individual toxic agents had specific differential capacities and thus from the syndrome itself the specific nature of the causative factor might be premised. How far this hope has been verified the author attempts to show. He is inclined to follow Bonhoeffer's generalization that typical psychical reaction forms are to be observed which are appreciably unrelated to the special form of the toxic agent. The differ-

ential and etiological criteria are not to be found in the mental picture but nearly always to be sought in the somatic or neurological findings.

Krisch then discusses some anamnestic material as a foundation for differential diagnosis. Choreic psychosis, amentia, psychomotor excitement in faulty cardiac compensation, puerperal stupor with mastitis, traumatic psychosis, myxedematous stupor, hallucinosis following gall-bladder operation, hallucinosis in typhoid, chronic nephritis with anxiety states, paresis, Landry's palsy with Korsakoff's syndrome, several epileptic psychoses, some hysterical psychoses; these make up the casuistic material reported upon.

The author says that in general for the diagnosis of what is subsumed under the title of the symptomatic psychoses, the symptom upon which the situation mostly hangs is that of mental confusion. It is the elementary symptom. The anamnesis then is to be relied upon; thirdly the length of time. Symptomatic psychoses, as such, run a short course; when the patient is sick longer than a month or six weeks, such speaks against a symptomatic psychosis. Finally, following Bonhoeffer, the author accents the diagnostic significance of the somatic parallel factors.

The monograph is well written, brings forward much of the most significant material, is weak, however, on the dynamic side and follows a little too closely the older phrase-making descriptive psychiatry.

JELLIFFE.

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Original Articles

CEREBELLAR AGENESIS WITH REPORT OF TWO CASES

BY FREDERICK P. MOERSCH, M.D.

STATE PSYCHOPATHIC HOSPITAL, ANN ARBOR, MICH.

In discussing the subject of cerebellar agenesis it is at the same time advisable to consider cerebellar atrophy as the two conditions are very intimately associated. Oppenheim (15), following Fickler (5) and Mingazzani (12), gives a very simple yet comprehensive classification of these conditions:

A. Congenital Disturbances:

1. Agenesis and hypoplasia of cerebellum.
2. Agenesis and hypoplasia of cerebellum with associated disturbances.

B. Acquired Disturbances:

1. Acute atrophies—(a) traumatic, (b) encephalitic, and (c) toxic.
2. Chronic progressive atrophies—(a) familial forms, (b) toxic, (c) arteriosclerotic, (d) cerebellar system diseases, (e) senile atrophies.

Primary physiological atrophies of the cerebellum are rare. As a rule there are associated lesions especially frequent in the cord. In the agenetic disturbances one is at times unable to find any evidence of structural involvement, but the question always arises as to whether the pathological examination has been complete.

To consider causation would take one too far afield. It is well to bear in mind, however, that agenetic disturbances are congenital,

atrophic are acquired. Congenital syphilis, tuberous sclerosis and encephalitis stand out prominently as etiological factors. Trauma, infectious diseases, etc., need only to be mentioned in passing. In many cases, especially if the individual survives for many years, which frequently occurs, it is practically impossible to establish a causative factor.

That cerebellar agenesis or atrophies may occur to an extreme degree without definite clinical symptoms has often been shown. The remarkable case of Combettes in which the cerebellum was represented by two small masses of white substance about the size of a pea is perhaps an extreme illustration. This patient, however, showed numerous cerebellar symptoms. Cases reported by Spiller (17), Neuberger (14), Monakow (13) and others, showed almost total agenesis of one or the other hemisphere of the cerebellum, but the clinical symptoms were so unimportant that these authorities did not suspect the existence of a cerebellar lesion. To say definitely that marked cerebellar lesions may occur without symptoms is perhaps untrue, for if the cases are critically reviewed, one will undoubtedly find that a severe lesion of the cerebellum is manifested by some slight symptom which may be attributed to some other cause or entirely overlooked.

To give the symptoms of cerebellar disturbances seems unnecessary. It is well, however, at this point to draw attention to the work of Thomas (18), Holmes (6) and Jelgersma (8), as well as others, who have pointed out that the cerebellum of animals is not so highly developed as that of man, and that results from experimentation on animals must not be considered as conclusive for man. Sherrington (16) in his work calls attention to the variation in size of the cerebellum in different animal species, depending upon the range and complexity of the habitual movements of the animal.

When one considers the clean cut, exact lesions which are produced by experimental methods, clinical pathological cases must be studied with extreme caution, for we are well aware that localized physiological lesions are rare, perhaps occurring only in agenetic cases.

As to the function of the cerebellum there seems to be a general unanimity of opinion. Luciani, in his exhaustive work, describes the cerebellum as "the organ which, by unconscious processes, exerts a continual reinforcing action on the activity of all other nerve centers." He divided cerebellar ataxia into three component parts, asthenia, atonia and astasia. Lewandowsky (10) considered

the cerebellum the central organ for muscular sense or for special orientation, in man especially acting to maintain the upright position. Oppenheim speaks of the function of coördination of complex or combined action. Thomas attributes equilibrium and coördination to the cerebellum, also using the term dysmetria, meaning an improper measuring of movements. The term synergia, was employed by Babinski (I) and later by Mills and Weisenberg (II), meaning coördination of associated special acts. Other authorities have used similar terms to express practically the same condition. Thus we see the concordant views held by these authorities. To show that there still exists some doubt as to cerebellar function, it is well to recall Sherrington's statement, "Knowledge is not ripe as yet for an adequate definition for the function of the cerebellum."

With this brief resumé, the following two cases are being reported because of their special interest to the subject. Pathological studies were made in the laboratory of the State Psychopathic Hospital, under the direction of Dr. Albert M. Barrett and Dr. Adeline Gurd, to both of whom I am indebted for their courtesy and help.

CASE I.—Grace H., aged twenty-six, single.

Heredity.—Several members on paternal side of family insane. Tuberculosis prevalent.

Personal History.—Birth uneventful. Patient learned to walk and talk twice. At about two years of age she had measles and whooping cough, at the same time several so-called spasms. She was ill for several months and it became necessary for her to learn to walk and talk again. She was backward, but obtained a seventh grade education. From the information it appears that she was always more or less seclusive and that she had a tendency to tire easily of walking. It was also noticed that she hesitated an instant when she raised herself out of a chair as though she were dizzy and tried to get her balance. No further evidence could be gathered as to any possible indication of organic brain trouble. At the age of twenty-three the patient became rather depressed and until the age of twenty-six this condition appeared intermittently without apparent cause. During her twenty-sixth year the mental condition became much worse, she imagined that everybody was against her, and for a time was suspicious of her mother. She was resistive and deeply depressed, unable to do any housework due to weakness. She spent considerable of her time in a rocking chair refusing to do anything. Because of this mental condition she was admitted to the

Kalamazoo State Hospital. Here she continued to be very restless, wandered about the halls moaning and lamenting and at times seemed to react to hallucinations. She gradually became more exhausted, dying four weeks after admission, due to general inanition. No diagnosis was made as to her mental state and no neurological condition was suspected. The physical examination was practically negative throughout with the exception of the marked emaciation. Laboratory examinations showed a negative blood Wassermann, albumin and casts in the urine. Neurological examination showed good musculature, no tremor, no paralysis, no ataxia or Romberg. Pupillary reflexes and deep reflexes were normal. The examination indicated no definite cerebellar lesion.

The pathological examination showed a general congestion of the internal organs with a pneumonic focus in the lower right lobe of the lung. The brain weighed 1230 grams. There was a severe chronic leptomeningitis and a marked atrophy of the cerebellar lobes. The measurements of the cerebellum were: Transverse diameter 8.8 c.m., longitudinal diameter 5 c.m., greatest thickness 4 c.m. The pons was also lessened transversally. Microscopically the pia was found to be slightly thickened containing a considerable number of granular cells and a few plasma cells. The glia in the molecular layer of the cortex was moderately increased and regressive in character. The nerve cells as a whole showed very slight alterations. Cord and medulla negative. The cerebellum showed marked changes in every section. The extreme narrowness of the cellular layers was apparent throughout. Under high power an almost complete absence of Purkinje cells was noted. The few present were small and scattered, not adhering to their ordinary position on the margin of the molecular layer. The pia was adherent throughout and the obliteration of sulci was caused by the growth of masses of connective tissue which had invaded the outer border of the convolutions for a variable depth. The glia in the molecular layer was thickened at the border, but cellular elements were almost entirely lacking.

CASE II.—Leo N., aged eighteen, single. Heredity unimportant.

Personal History.—Birth normal. At the age of three months he is said to have had spinal meningitis and inflammation of the bowels. He was ill for thirty days during which time he is said to have had several convulsions. He apparently made a good recovery. At the age of six he began school but was rather back-

ward in learning, leaving at the age of fourteen, having reached the sixth grade. At nine the patient had keratitis of unknown origin which left a scar on the right cornea. At eleven he had several convulsions. Nothing further of interest was noted until a month prior to his death. It is stated that he was always considered somewhat slow and mentally backward. There was never any difficulty of gait.

Present Troubles.—A month prior to his death he complained of headache. For several days he seemed rather restless and uneasy. This condition passed away and for two weeks he again seemed quite normal. Two weeks later he was found one evening extremely nervous and had a peculiar way of stretching his tongue out of the left side of his mouth. He talked rather unclearly, and when examined by a physician it was found that his temperature was 103°. His condition rapidly became very serious. Mentally he became confused, talked of things being on fire and did not sleep except under hypnotics. Five days prior to his death he was admitted to the hospital. At this time he seemed dazed and unclear, kept moving his head about, frequently protruding his tongue and his arms showed a constant movement, more or less grossly choreiform in character. When placed upon his feet he had a tendency to hop from one foot to the other. When in bed he kept tossing himself about continually, rubbing his body, snapping his fingers, rolling from side to side, grimacing and throwing himself about in a purposeless manner. At times the movements would entirely disappear only to recur again, being absolutely purposeless, involving all muscles, with no definite rhythm. He obeyed commands but was disoriented. When left to himself he kept up an incoherent jabbering which it was almost impossible to understand. Examination at this time showed a marked flushing and irritation of the skin, the lips were swollen and sore, the tongue coated, markedly tremulous, partaking of the choreiform movements. The teeth were notched and pegged. The abdomen was rigid and sensitive to pressure. The pulse was rapid, 140 a minute and there was considerable intercostal retraction. The fundi showed neuroretinitis with some retinal edema. The pupils reacted sluggishly to light. Occasionally a slight rotary nystagmus was noted. There was no definite motor weakness except that due to involuntary movements. The deep reflexes were equal on both sides, being slightly exaggerated. The speech was distinctly impaired, at times jerky as if the laryngeal muscles were partaking of the choreiform

movements. The urine examination was negative, a white cell count showed 18,800, the blood Wassermann plus minus, spinal fluid Wassermann plus minus, cells 15, albumin negative, Nissl-Esbach 2, gold chloride 00111000, Mastic 110000. The patient's condition gradually became worse. Mentally he became more confused, there being a low muttering delirium from which it became more and more difficult to arouse him. He died five days after admission, the movements having entirely disappeared in the last few hours of his life. Clinical diagnosis was lethargic encephalitis, choreiform type.

The post mortem examination showed a serous peritonitis, the cause of which was not determined. There was no other pathology of the internal organs. On removal of the brain it was noted that the left side of posterior fossa was more shallow than the right. The width of the left posterior fossa was 5 c.m., right 7 c.m. The left cerebral hemisphere was strikingly smaller than the right. The convolutions of the superior lobe of the left hemisphere seemed to be well formed, while on the under surface of the lobe the lobules were greatly reduced in volume being nearly rudimentary. The brain weighed 1250 grams. Measurements of the cerebellum were as follows: Right lobe, lateral diameter 4 c.m., anterior posterior 6.5 c.m. Left lobe, lateral diameter 4 c.m., anterior posterior 5 c.m. The vermis was rather irregular and pushed to the left of the middle line. In the region of the biventer no convolutions were noted.

Microscopic Examination.—An acute condition was found and diagnosed as lethargic encephalitis. This was characterized by numerous foci of infiltration, chiefly about engorged blood vessels in pons and medulla, but also present to some degree in all other portions of the brain. The infiltrating cells were mainly small lymphocytes with some plasma cells. The endothelium of blood vessels was swollen and in places proliferated to such a degree as to produce practical occlusion. There were several pial hemorrhages and one rather large hemorrhage in the right thalamus. Glial reaction was marked throughout with considerable satellitosis and some degeneration of nerve cells. The left cerebellar hemisphere showed a marked increase of glial structure with a moderate diminution of Purkinje cells. The right cerebellar hemisphere was apparently normal. The right olive was atrophied and showed but few normal nerve cells. The right red nucleus, while somewhat smaller in cross section than the left, showed no definite lesion. A purulent meningitis of the cord was also present. This did not

extend above the second cervical segment. The only indication of a syphilitic process was the rather pronounced arteriosclerosis, which had no apparent relation to the acute condition.

It is clear that in both of these cases severe trauma occurred before the function of the cerebellum had been fully established, and it is on this basis that one believes restoration to be possible. It may be stated, that as a rule, congenital conditions show marked improvement, while acquired conditions do not show the same marked tendency to reestablish function. It has been further observed that where atrophies occur in imbeciles in which the cerebellum is also affected, the compensatory function is but partial. Luciani removed the frontal lobes in decerebrated animals with return of cerebellar symptoms. This corresponds somewhat to the work of Jelgersma who would divide the cerebellar syndrome into a frontal or atonic incoördination and temporal or equilibrial and locomotor portion. Tumors of the temporal lobe frequently give as part of their symptomatology disturbances of equilibrium and locomotion, while frontal tumors are not uncommonly accompanied by disturbances of incoördination. Lewandowsky was of the opinion that many of these symptoms were entirely cerebellar and due to *contra-coup*. However more recent work seems to show fairly conclusively that there are fibers, extrapyramidal in character, which run from these regions in the cerebrum to the cerebellum by way of the middle peduncle.

In the first case, as was noted, the changes in the cerebrum were slight, while the medulla, cord and olives seemed practically negative. The disease process apparently confined itself entirely to the cerebellum and undoubtedly belongs to the first group of our classification, being fairly typical of cerebellar agenesis, which, physiologically, acts as a circumscribed lesion. If it is true that the Purkinje cells are the chief factors in the cerebellum, certainly in this case the cerebrum compensated quite fully. Bing (3), in his work, calls attention to this vicarious, compensatory action of other nerve centers, especially those of the cerebral cortex. To emphasize this point he goes even further and states that the cerebellum is not the seat of an independent function but acts purely as a correlator of centripetal impulses, any interruption of which in the healthy structure results in compensation.

In the second case one has as the acute pathological picture a lethargic encephalitis, this process, however, having no bearing upon the chronic progressive atrophy. No attempt is made to correlate

the pathology with the choreiform movements. Suffice it to say that the pathology of the corpus striatum seemed hardly sufficient to account for such a disturbance, especially in the light of the more recent work of Bielschowsky (2) on the normal structure of the corpus striatum. Klein (9), in his work on spasms and rhythmic movements associated with lesions of the vermis and dentate nucleus, lays great stress on the relation of the cerebellum to choreiform movements. This, however, is not germane to our subject.

From an etiological standpoint the possibility of the atrophy in this case being due to syphilis is quite evident. However, as there was no active syphilitic lesion in the brain, one may justly assume that at this time it would be difficult to establish the relationship. The acute purulent meningitis of the cord we regarded as secondary to the peritonitis, and in no way related to the chronic atrophy.

The change in the cerebellum, while not so extensive as in the first case, produced a far greater change in associated areas. The right olive, as noted above, was markedly atrophied throughout, appearing shrunken and considerably smaller than the left. Dejerine and Thomas (4) in describing *Atrophie Olivo-Ponto-Cerebelleuse*, showed that in addition to the atrophy of the cerebellum and olive there is a degeneration of gray substance of pons, middle and posterior peduncle. While we could not positively trace this degeneration, our case apparently would fit into this group. Holmes and Stewart (7) have attempted to localize definite areas of relation between the cerebellum and olives, while Mills and Weisenburg's scheme of localization in the human cerebellum is most illuminating. Klien, Dejerine, Villiger (20) and others have shown that lesions of the cerebellum produce a degeneration in the contralateral olives, in man the connecting fibers being cerebellofugal, in animals cerebellopetal. Whether or not these fibers are definitely connected with the Purkinje cells one would be unable definitely to determine from these cases, for it is in the first case with the more severe destruction that the olives are normal, while in the second case, with a relatively less marked destruction of Purkinje cells, the contralateral olive shows a marked change.

In reviewing these two cases, one cannot help agreeing with Klien that the cause of cerebellar symptoms is not so much a lesion of the cerebellum as an interruption of the efferent and afferent paths. How these paths are interrupted depends upon physiological grounds. Two distinct types of lesions are dealt with in these cases. The first showed a hesitancy in gait as its only clinical

manifestation; the second was characterized by a moderate slowness of the movements together with some mental retardation. Just how the compensatory function is established remains a matter of conjecture. Certainly it may be assumed that the cerebellum functions as a relay in the corticopetal system, and when removed requires a reestablishment of new impulses which undoubtedly have their origin in the cerebrum. For this reason agenetic or infantile atrophic conditions are usually markedly compensated, while, as is recognized clinically, lesions occurring in adults rarely show such reestablishment of function.

From this brief discussion, if one considers the facts as they present themselves, the following conclusions may be drawn:

Cerebellar agenesis or atrophy may supervene without being clinically demonstrable, though invariably a critical review will show suggestive indications of such an existing lesion.

It is at times practically impossible to determine whether one is dealing with an agenetic or acquired lesion of the cerebellum.

The cerebellum is definitely subordinate to the cerebrum and must be looked upon as an organ of late phylogenetic development, having in itself no initiative function.

Cerebellar function is of a complex or combined nature, in all probability made up of component parts arising in various portions of the forebrain.

The olivocerebellar fibers are crossed and cerebellofugal in character.

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AN ANALYSIS OF SUICIDAL ATTEMPTS

BY LAWSON G. LOWREY, A.M., M.D.

CHIEF MEDICAL OFFICER, PSYCHOPATHIC DEPARTMENT, BOSTON STATE HOSPITAL;
INSTRUCTOR IN NEUROPATHOLOGY AND IN PSYCHIATRY, HARVARD
MEDICAL SCHOOL

It is well known in institutions for the insane that successful attempts at suicide within the hospital are most likely to be made by cases of dementia præcox, since cases with any expressed suicidal ideas, or cases with marked depression are always closely watched, so that the chance for them to consummate any such untoward end is decidedly minimized. In dementia præcox cases, however, the idea is usually suddenly conceived and as suddenly carried into effect, often with no expressed reason, when they are referred to as "impulsive." Hence they are sometimes successful.

Other types of cases sometimes make such attempts. Thus spectacular attempts are made for the purpose of gaining sympathy or some particular end, but ordinarily such patients do not intend to succeed in the attempt. Occasionally they do so however. In other cases attempts are made from pique or spite, simply a carrying into action of the small boy's mood and imaginations when he pictures the grief of his family and friends over his untimely demise due to their harshness. Fortunately the boy always finds that his mood succumbs to the distractions of his environment.

In an observation hospital of this type it is natural that a considerable number of cases should be seen, usually shortly after the attempt, in which suicide has been attempted. Lacking any accurate statistics on the causes for such attempts and diagnoses in the cases attempting it, we have taken a random series as they came to us, utilizing the admissions of about 6 months for this purpose. In all we have sufficient data on 46 cases to analyze them for diagnoses, reason or reasons for the attempt, and methods selected. We have presented them very briefly, leaving out all data not pertinent to the matter in hand.

CASE 1. F. Attempted to cut her throat because the Devil made her. Diagnosis: paranoid dementia præcox.

CASE 2. F. Swallowed pins because God (voice) told her to sacrifice herself. Diagnosis: paranoid dementia præcox.

CASE 3. M. "Weak attempt" at suicide by gas in a depression, thinking that his wife wanted another man. Diagnosis: psychopathic.

CASE 4. M. Cut his wrist because of persecution and jealousy of his wife. Diagnosis: Paranoid condition.

CASE 5. F. "Pseudo attempt" for the purpose of gaining sympathy. Gas. Diagnosis: psychoneurosis.

CASE 6. F. Jumped from rocks thirty feet into water to relieve her family of the responsibility for her. Diagnosis: Manic-depressive.

CASE 7. M. Jumped from a bridge into the water, as he was followed and persecuted by spies. Diagnosis: paranoid condition.

CASE 8. M. Cut his throat in a depression as his fellow workmen talked about him. Diagnosis: manic-depressive.

CASE 9. F. Attempted suicide by strangulation and by taking an overdose of medicine, because of her persecutions. Diagnosis: paranoid dementia præcox.

CASE 10. F. Thrust her fingers down her throat and kept them there until almost choked. Due to delusions. Diagnosis: hebephrenic dementia præcox.

CASE 11. M. Cut his wrist because he was "yellow." Diagnosis: catatonic dementia præcox.

CASE 12. F. Attempted suicide by gas. Would not explain. Diagnosis: catatonic dementia præcox.

CASE 13. M. Attempt with gas. Involved in two love affairs, with resulting conflict, loss of interest and determination to end it all. Diagnosis: hebephrenic dementia præcox.

CASE 14. F. Suffered from tuberculosis, became discouraged and tried gas and hanging. Diagnosis: psychoneurosis.

CASE 15. M. Cut his wrist because of discouragement over having tuberculosis. Diagnosis: hebephrenic dementia præcox.

CASE 16. F. A voice told her to turn on the gas, which she did. Diagnosis: dementia præcox.

CASE 17. M. Made a scratch on his neck "but something held me from doing more" in a depression after his son's death. Diagnosis: psychoneurosis.

CASE 18. F. Turned on the gas because people made remarks about her children and were jealous of and persecuted her husband. Diagnosis: Manic-depressive.

CASE 19. M. Took iodine, but would give no reason. Diagnosis: simple dementia præcox.

CASE 20. M. Took strychnine because his sister annoyed him. Later while markedly depressed cut his throat in two places and both wrists. Diagnosis: manic-depressive.

CASE 21. M. Attempted to cut throat because of his suffering from headaches and dizziness. Diagnosis: depression with paralysis agitans.

CASE 22. M. Attempted to hang himself the morning after a big

drunk which landed him in jail. Diagnosis: not psychotic, acute alcoholism.

CASE 23. F. Tried to shoot herself for several reasons: doing poorly in school, over which she worried, quarrels between her mother and father, the news that her brother was hurt and not expected to live. Diagnosis: psychopathic.

CASE 24. F. Jumped from a bridge in a depression sometimes following the death of her fiancé, believing she was going insane. Diagnosis: Manic-depressive. (She later succeeded with gas.)

CASE 25. F. Attempt at drowning (given up) as she thought she was going insane. Diagnosis: undiagnosed psychosis.

CASE 26. F. Took bichloride of mercury because she had not had letters from home. Diagnosis: psychopathic.

CASE 27. F. Depressed and self-accusatory, she attempted drowning as she could not stand the tension in her head. Diagnosis: Manic-depressive.

CASE 28. F. Took morphine and attempted to cut a vein in her wrist. Refused to explain. Diagnosis: undiagnosed psychosis.

CASE 29. M. Attempted to cut his throat with a pair of scissors because of depression and self-accusatory ideas. Diagnosis: manic-depressive.

CASE 30. M. Attempt by gas because his headaches had become worse. Diagnosis: psychosis with cerebral syphilis.

CASE 31. F. In recurring fits of mild depression had attempted as a child to cut throat with scissors, at other times with gas and poison. Diagnosis: psychopathic.

CASE 32. F. Several attempts, not explained, usually in association with depressed spells. Diagnosis: epilepsy with psychosis, depressed and deluded state.

CASE 33. F. Attempted to throw herself from the window and to hold her head under water, as she feared she had cursed God and heard voices telling her to kill her mother and sister. Diagnosis: dementia præcox.

CASE 34. F. Made several attempts, the last by cutting her wrists, when depressed and jealous about her roommate, whom she loved. Diagnosis: psychopathic.

CASE 35. M. Tried to hang himself in confusion following convulsion. Diagnosis: epilepsy.

CASE 36. F. Tried to jump from a window and cut her throat, since she should be punished for her great sins. Diagnosis: senile psychosis, depressed and agitated type (in addition to deterioration).

CASE 37. M. Attempt by gas because of depressed ideas. Diagnosis: manic-depressive.

CASE 38. M. Took poison as he regretted everything he had ever done and the future held nothing for him. Diagnosis: paranoid dementia præcox.

CASE 39. M. Three attempts by gas in recurring attacks of depression, usually carefully planned so he would be interrupted before death occurred. Diagnosis: manic-depressive, psychopathic. (Later killed himself with gas.)

CASE 40. M. Made a sudden attempt with a carving knife, because of delusions and hallucinations. Diagnosis: paranoid dementia præcox.

CASE 41. M. Took iodine as God told him to. Diagnosis: paranoid dementia præcox.

CASE 42. M. First attempt (denied by patient) by gas while drunk on jamaica ginger and hard cider: second attempt by cutting in order to gain wife's attention. Diagnosis: chronic alcoholic deterioration. (Later successful by cutting throat.)

CASE 43. F. Turned on the gas. She claims she did so because people disliked her because of her odorous gastritis, but her family believe it was in order to prove to them that she believed in her delusions. Diagnosis: paranoid dementia præcox.

CASE 44. F. Deluded and hallucinated for years, the patient set her clothes on fire under the influence of her delusions. Diagnosis: paranoid dementia præcox.

CASE 45. M. An epileptic negro under arrest became depressed, believed there was nothing in life for him and made an attempt by eating glass. Diagnosis: epilepsy, clouded and depressed state.

CASE 46. M. Suffering with hemiplegia and realizing he would not get better, though without insight into his mental deterioration, attempted to throw himself from a window and to cut himself. Diagnosis: psychosis with cerebral arteriosclerosis.

We have not given in any case the supporting evidence for the diagnoses, as we have not considered it necessary. It is rather surprising to find such a high proportion of dementia præcox cases making suicidal attempts. Sixteen cases of dementia præcox attempted suicide as against nine cases of manic depressive. However, this is probably to be explained on a relative basis, since we admit about three times as many cases of dementia præcox as we do of manic depressive. But even then the number of præcox cases in which suicide is attempted is sufficiently great to emphasize the need of watchfulness in this respect. Such attempts are usually not half hearted, as is the rule with the psychopathic personality cases, of which there are 5. In these latter and in the psychoneurotics, of whom there were three, the attempt is usually made to gain some specific end. If the end is attained there may or may not be repetitions, depending on whether a situation arises in which this particular weapon is thought by the patient to be efficacious. Sometimes such patients are momentarily sincere in their desire to die, but lose

their ambition to do so when the unpleasant features of dying force themselves into attention. Many a patient has been saved because "the water was too cold," or cutting the throat "too messy," or the poison tasted badly, or they could not stand the unpleasant odor of the gas. These are actual reasons for abandoning the attempt, or calling for help at once, which have been given by patients.

The diagnoses in the other cases are as follows: paranoid condition 2, alcoholic 2, epileptic 3, undiagnosed psychoses 2, depression with paralysis agitans 1, cerebro-spinal syphilis 1, senile psychosis with depression 1, arteriosclerotic psychosis 1. It may be noted that practically all of these were associated with depression as the moving feature for the attempt.

The immediate causes for the suicidal attempt are of great interest, though somewhat difficult of simple analysis. In seven cases the attempt was directed by hallucinations or delusions which were followed out, and in six cases the attempt was due to the patient's effort to escape the persecutions. Depression was the cause of 14 attempts: an attempt to gain sympathy or attention was responsible for 5: four would give no explanation: 5 made the attempt in discouragement because of physical symptoms which discouraged them: 3 made attempts in confused periods the result of epilepsy: 1 was trying to escape a love tangle: and 1 believed that she should in that way escape insanity. It will be seen from this analysis that, although depression is the most frequent cause, it is responsible for only about one-third of the attempts, a point which is by no means generally recognized.

Ten methods were employed by these would-be suicides. The favorite method was by cutting, seventeen attempting to cut their throat, or vessels elsewhere, usually in the wrists. The next most popular method was by gas, used by 13. Eight tried poison, 6 drowning, 4 hanging, 3 jumping out of a high window, 2 swallowed foreign bodies, 1 tried strangulation other than hanging, 1 tried shooting, and 1 set fire to herself. Several patients made attempts in several ways, so that the total of attempted methods is greater than the total of patients. There are other striking methods which are occasionally employed, but not represented in this series. Such are attempts at electrocution, jumping in front of a moving vehicle, and bizarre methods of bleeding oneself (as the patient who tore herself, causing a recto-vaginal fistula). These are all of the ordinary methods which are used for self-destruction. In other words, any method which is generally known to result in death is likely to be used at one time or another by persons bent on suicide. The only

methods not represented are freezing and starving, which are occasionally resorted to.

The use of a sharp instrument for cutting and gas account for more than half of our cases. This is a rather remarkable finding, and one wonders whether it would be borne out in any large group of cases. The successful suicides, as reported in the newspapers, seem to resort to shooting and poison more frequently than is the case in this series. Perhaps the success of these methods is responsible for the small number of such cases which we see. Another point is that knives or razors and gas are much easier to obtain than are guns and poisons. In other words, the tools which are at hand are those commonly chosen. Curiously enough, bichloride of mercury was infrequently used, despite its newspaper publicity.

Much useless argument has resulted from trying to determine whether all persons who attempt suicide are insane or psychopathic. We see an occasional case that is neither insane nor psychopathic, but the great majority are one or the other. However, any person may make such an attempt, successfully or otherwise, and be entirely normal at the time. There are many conceivable situations in which the logic of the position may quite well indicate to the individual that death is the lesser of the evils which confront him. Accordingly no blanket judgment can ever be passed on this topic. Nevertheless, it is quite true that the burden of proof in the individual case rests on the one who claims normality for the person who suicides. But even when insane or psychopathic the reasons are not always the same and need to be gone into very carefully if we are to obtain any proper therapeutic effect.

SUMMARY

In 46 cases making unsuccessful attempts at suicide and examined at the Psychopathic Department, 16 were cases of dementia præcox, 9 were cases of manic depressive, 5 of psychopathic personality, 3 of psychoneurosis, and the others scattered.

Such a large number of cases of dementia præcox was unexpected, and may partly be explained by the fact that we see 3 times as many præcox as manic depressive cases.

It is evident however that we must guard against suicidal attempts in dementia præcox much more than we have thought necessary.

In fourteen cases the attempt was due to depression; in 7 by direction of hallucinations or delusions; in 6 to escape persecution;

in 7 to escape physical suffering, or social complication or mental disease.

The number due to depression is unexpectedly low, and indicates the need for guarding other than depressed cases, and particularly delusional cases, against this danger.

The methods used, in order of popularity were: cutting, gas, poison, drowning, hanging, jumping from a height, swallowing foreign bodies, strangulation, shooting, and setting fire to the clothing, leaving electrocution, moving vehicles, freezing and starving not represented.

Normal people occasionally commit or attempt suicide, but all of the cases in this series were insane or psychopathic or in an abnormal state as the result of alcoholic excess at the time of their attempts.

I am greatly indebted to Miss Sarah F. Schroeder, clinical historian, for her careful collection of the data regarding these cases.

CONTRALATERAL PLANTAR REFLEX AND ITS CLINICAL INTERPRETATION¹

BY ALFRED GORDON, M.D.

PHILADELPHIA

The knowledge of contralateral reflexes seems to date from Westphal (1). He observed that stimulation of one limb provoked contraction of the other. Subsequently Strümpell (2), Marie (3), Hinsdale and Taylor, and Ganault observed contraction of the adductor muscles of one thigh by percussing the patellar tendon of the opposite side. Dejerine observed in two cases of spastic paraplegia contraction of one tendon Achilles when that of the opposite side was percussed. Ganault (4) observed simultaneously homolateral and contralateral cremasteric reflexes. Not a few examples of a contralateral plantar reflex are found in the literature. Ganault, Babinski (5), Bramwell (6), Klippel and Weill (7), Steinberg (8), Strümpell, Lewandowski, Babinski and others observed the following phenomenon in some organic nervous diseases: irritation of the plantar surface on the normal side is followed by flexion of the toes on the same and on the affected sides, while stimulation of the sole on the involved side produced extension of the toes on the same side and no movement or flexion on the sound side.

Among a large number of organic nervous cases seventy-eight presented the contralateral reflex. In the present contribution the investigation of the crossed plantar reflex was conducted along the following lines:

The test was made with Babinski's, Oppenheim's and the author's methods. The stimulation in the unilateral lesions was carried out on the affected side as well as on the unaffected. The observation of the plantar response was registered for either side, the stimulated and non-stimulated side.

The entire group of cases comprised forty hemiplegias, fifteen cases of luetic myelitis with a more or less pronounced degree of paraplegia; four cases of multiple sclerosis, two cases of syringomyelia, three cases of hematomyelia, two cases of tumor of the spinal

¹ Read by title before the American Neurological Association, June 1, 2, 3; 1920.

cord, four cases of amyotrophic lateral sclerosis, eight cases of intermittent attacks of monoparesis or hemiparesis due to spasmodic closing of cerebral arteries.

I. HEMIPLEGIC GROUP

Two sub-groups could be considered here, as the results obtained differ in each of them.

First Sub-group.—In thirty cases a very slight stimulation of the sole on the paralyzed side produced a dorsal movement of the toes on the same side and no movement of the toes on the healthy side. However, if the stimulation was made vigorously, plantar flexion of the latter was observed. Since Oppenheim's and the writer's methods require a stronger impression than Babinski's procedure, flexor response of the toes on the nonaffected side was observed by those two methods in all the thirty cases.

When stimulation of the toes was carried out on the sound side flexion of the toes on the same side was obtained in all thirty cases and on the paralytic side only in twenty-two cases. In the other eight cases dorsal extension was obtained on the affected side. The contralateral extension presented this peculiarity: that it was slow in its manifestations and was confined in some cases to the great toe and in other cases to all the toes. Oppenheim's and the writer's methods gave precisely the same results as Babinski's method.

Second Sub-group.—In the remaining ten cases of the hemiplegic group all the three methods applied first to the affected side gave dorsal extension on the same side and plantar flexion of the toes on the normal side. The results were identical whether in Babinski's method the stroking of the sole was done very gently or vigorously. When, however, the stimulation commenced on the sound side, downward flexion was observed on both sides.

II. MYELITIC GROUP

The fifteen cases of this series presented very interesting data with regard to the contralateral plantar reflex. They were all of a luetic character as proven by the positive serological findings. Several cases (8) presented an asymmetrical distribution of symptoms in the lower extremities, viz., the paretic condition of one was less or much less marked than in the other. The patellar tendon reflex was only slightly increased and the plantar reflex was distinctly flexor upon direct elicitation on the same paretic side. The anamnestic data, however, pointed to a very probable involvement of the

motor tract on the same side. It is highly interesting to observe that the extensor phenomenon became apparent on this side when stimulation of the sole of the other foot was carried out and only when this stimulation was energetic. With a very slight stimulation the contralateral reflex was totally absent. With the other two methods this reflex was extensor. A more instructive observation in this respect is the fact that the later development of the myelitic condition had finally shown conclusively the involvement of the motor tract, namely by the presence of markedly increased patellar tendon reflex, of ankle clonus and toe phenomenon upon direct stimulation of this side, contrary to what was seen in the early phases of the diseased condition as mentioned above.

In the remaining seven myelitic cases in which the symptoms of motor tract involvement were pronounced on both sides although unequally distributed, the contralateral reflex was present on either side. Curiously enough, while the direct reflex was extensor, the contralateral reflex was flexor on both sides.

III. GROUP OF CASES OF INTERMITTENT PARALYSIS

The eight cases of this group present the most instructive data concerning the value of the contralateral reflex. The pathological condition observed in this group of cases is due to spasmodic closing of cerebral arteries and is analogous to the condition known under the name of "intermittent claudication," caused by an obstruction in the arterial supply of the legs when the latter are put into action. The clinical picture of these cases is characterized essentially by a sudden onset of hemiparesis. The latter was never complete. Sometimes it was pronounced, sometimes moderate and at other times exceedingly slight. The degree of involvement of the limbs was in some attacks so imperceptible that with only a very careful test could a slight difference be detected in the power of the affected and unaffected extremities. The number of attacks varied from one individual to another. Some had an attack every three or four months. Others had them on rarer occasions, once or twice a year. All these attacks were transient. Their duration was never longer than a few days. The briefest time was a few minutes. In some patients an attack lasted several hours. No matter how slight the apoplectic attack may have been, there would always remain a certain degree of paralysis ranging from a mere weakness to a perceptible paretic condition. The patellar tendon reflex was slightly increased on the affected side. On direct examination the test for

Babinski's sign gave negative results, the toes remained immovable on stroking the sole of the foot, there was neither extension nor flexion. Oppenheim's sign was likewise negative, but the author's sign was present in six out of seven cases.

When the test was made for the contralateral reflex the following condition was observed: Slight stimulation of the foot on the normal side produced flexion of the toes on the affected side. Strong stimulation by the Babinski method, as well as by Oppenheim's and the author's method invariably gave extension of the great toe or of all the toes. When the affected side was stimulated, the contralateral plantar reflex on the normal side was exclusively flexor in type.

The subsequent histories of intermittent hemiparalysis were identical in almost every case, namely that as the attacks continued to recur, their duration became more and more prolonged. According as the motor phenomena became more pronounced, the patellar tendon reflex became pronounced; ankle-clonus was present and the plantar reflex on homolateral stimulation became evident. Finally all the cases terminated with severe apoplectic insults, some with and others without aphasia. From that time on the hemiplegic condition remained permanent.² In this stage the contralateral reflex presented the same characteristics as in the first series of hemiplegic cases, *i. e.*, in the majority (six cases) it was flexor on the affected side, and only in two was it extensor.

The instructive feature of this series of cases is found in the early existence of a positive contralateral reflex, extensor in type, on the side in which the motor tract is destined eventually to be involved in a very definite manner.

IV. MULTIPLE SCLEROSIS GROUP

In all the four cases besides the characteristic cardinal symptoms there was an extensor plantar reflex on direct stimulation and only in two cases could a contralateral reflex be elicited on both sides. In one of them it was flexor on either side, in the other extensor on both sides. It is interesting to observe that the first of the two was, at the time of the examination, of much shorter duration than that in the second patient.

² See author's work on intermittent closing of cerebral arteries in relation to apoplexy in *JOURNAL OF NERVOUS AND MENTAL DISEASE*, August, 1914, p. 501.

V. SYRINGOMYELIC GROUP

In the two cases a bilateral extensor plantar reflex was present on direct stimulation by all the three methods. A contralateral extensor reflex on one side was present in one case and precisely on the side which was the least involved, viz., where the parietic condition of the leg and the patellar tendon reflex were less marked than on the opposite side. In the other case no contralateral response at all could be obtained.

VI. HEMATOMYELITIC GROUP

In all the three cases direct stimulation elicited extensor plantar-reflex on either side. A contralateral reflex was present on both sides. In one case only upon strong stimulation of the sole of the foot, and by the other two methods; it was flexor in type. It was present on the side most affected, viz., in which the tendon and cutaneous reflexes were pronounced.

VII. CASES WITH TUMOR OF THE SPINAL CORD

In one case the lower cervical region, in the other the lower dorsal segment, was involved. In both cases there were both direct and crossed extensor plantar reflexes on either side. The latter could be obtained only upon strong stimulation of the soles of the feet and always by Oppenheim's and the author's methods. Both kinds of reflexes remained unaltered after removal of the neoplasms.

A peculiarity deserving mention is that the direct extensor response before the operations in both cases was very slight while the contralateral responses were quite pronounced.

VIII. CASES OF AMYOTROPHIC LATERAL SCLEROSIS

In only one case, which was quite advanced, direct extensor plantar reflex was present and it could be elicited on both sides by all the three methods. The other three cases presented increased reflexes and the toe phenomenon only with Oppenheim's and the author's methods. A contralateral reflex could be obtained in all the four cases, flexor in the first case and extensor in all others, but exclusively by strong stimulation of the soles, and also by the other two methods. In the first case it was present on both sides; in the others it was present on both sides in two and in one on one side.

SUMMARY

In the case of definitely established hemiplegia the largest number gave crossed plantar flexion on the normal and affected side and only in eight cases crossed plantar extension.

The myelitic cases demonstrate the fact that when the motor tract involvement on one side was not in total evidence and doubtful, the presence of crossed extensor plantar reflex on the same side justified the possibility of such an involvement, and later development subsequently showed it. This demonstration can be carried out only with strong stimulation of the sole of the foot.

The group of intermittent paralysis gave identical results. Here again in the early stages and upon direct examination there was total absence of the toe phenomenon on the side which suffered attacks of transient hemiparesis but it was present upon strong stimulation of the opposite side. Subsequent events have proved that the motor tract was undergoing slow but profound changes.

The remaining groups of cases presented the peculiarity that the contralateral extensor response was present on the side on which motor phenomena were the least marked.

CONCLUSIONS

Clinical.—Among all the cases the series of intermittent hemiparesis is the most significant with regard to the diagnostic value of the contralateral reflex. Individuals who present one or two temporary and fleeting hemiparetic attacks are constantly threatened with final apoplectic insults. It is therefore extremely important to determine whether the original condition is of an organic or functional character. In view of the fact that in the early stages no marked evidences of motor tract involvement are present and therefore doubt is justifiable, the existence of a plantar reflex of an extensor character is, as Babinski has proved, of great value. Since by direct stimulation no reaction is obtained and by contralateral stimulation a positive extensor reaction is obtained, the latter is of a certain significance. This is especially significant when the further development of the disease amply proves the organic character of the condition. A parallel condition is observed in cases of other groups in which mild paretic states were accompanied by no striking manifestations of the motor tract so that doubt as to their nature was warranted, and yet a contralateral reflex helped to reveal the true character of the pathological state. In all such cases the stimu-

lation of the sole in the Babinski method must necessarily be vigorous as slight stimulation may give no response at all.

Another interesting feature of this study is found in the fact that in the largest number of well established and old standing paralysis there is a contralateral reflex which is flexor on the paralytic side as well as on the sound side provided in the latter case the stimulation is strong. In a certain number of cases, however, this reflex was extensor on either side. The existence of a crossed reflex on the non-affected side by stimulation of the affected side suggests the possibility of the following considerations:

Pathogenesis.—According to Pflüger's law of reflectivity a minimum of excitation of a very limited area in an animal whose reflectivity is exaggerated, does not remain confined to this area; there is radiation of stimulation to the opposite symmetrical side and the resulting movements are bilateral. When the stimulation is strong, the first movement is immediately followed by other movements on the side of stimulation.

Applying this information to the toe-phenomenon, one must first of all bear in mind that it is a cutaneous reflex, that the physiological rôle of the encephalo-medullary long pathways is indispensable for production of cutaneous reflexes and finally that it is the expression of disturbances or degeneration of the pyramidal system.

When stimulation is produced on the paralyzed side the motor response follows from the cerebrum downwards along the pyramidal system. Since the latter is distributed, the reaction will be reversed from normal, viz., extension instead of normal flexion.

When the sound side is stimulated, the motor response is carried along a normal pyramidal pathway; hence the plantar reflex is flexion of the toes.

It should be borne in mind that the anterior commissure of the spinal cord contains fibers connecting cells of the anterior cornua on both sides. Therefore, during the elicitation of a plantar reflex on one side the motor influx may be carried through the anterior commissure to the cells of the anterior cornua of the opposite side. When stimulation is carried out on the sound side, the plantar reflex on the same side will be flexor because the motor phenomenon passes through a normal pyramidal tract. For this very reason the motor influx spreading to the cells of the opposite side will also produce flexion there. It is a well known fact that in hemiplegics the nonaffected side presents an increased excitability which is manifested by an exaggerated generalized reflectivity, hence in view of

the above mentioned Pflüger's law, the presence of a contralateral reflex is readily explained. The passage of the motor influx through diseased pyramidal tract will explain the absence of a contralateral reflex on the sound side when stimulation is done on the paralyzed side. The degree of involvement of the tract will explain why in some cases a contralateral reflex is present on the sound side. If its degeneration is very slight, transmission from the diseased side will still be carried to the cornua of the opposite side, also for the same reason the contralateral response on the affected side will be extensor instead of flexor. It also explains the necessity of strong stimulation in some cases for the elicitation of contralateral plantar reflex.

It seems, therefore, that the presence or absence of a contralateral reflex is an indication not only of the presence of alterations in the pyramidal tracts but also of the intensity of its alteration. It is consequently a valuable diagnostic phenomenon.

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IS THERE AN IDEAL TREATMENT OF MORPHINISM?

BY C. B. PEARSON, M.D.

CATONSVILLE, Md.

"Hitch your wagon to a star." No man ever had an arm long enough to do this. So that all the above saying can mean is the higher your ideals the better.

In a way this is true. But a lofty ideal that takes no thought of the difficulties in the way of its attainment is to my mind at least not a very good thing.

It would seem from the state and national antinarcotic laws that one of the ideals of the American people is to banish morphinism and other forms of opiumism from our country entirely.

In discussing this question I mean to take into account the management of the addict as well as the therapeutics of the disease morphinism. It seems to me that our people have taken up this ideal of no morphinism among us without the slightest thought of the difficulties in the way and further without any knowledge of what morphinism really is.

After five years of labor along this line the problem is still unsolved. The majority of people have studied the problem no farther than to learn that morphinism is a very bad thing. The next idea following this is then let the law stop it.

It may be that my thoughts are colored by the fact that my health is not as good as it might be, and also because I am not as young as I once was. However it is my opinion, and the reader can agree with me or not just as he chooses, that it is not wise to attempt to remedy every supposedly bad thing by law.

If we do, we will find after a time that we will have one half of the country playing the spy on the other half.

Let us once reach this condition, and we will be about where Russia was under the Czars. A majority or even a well-organized minority can be every whit as tyrannical as any autocrat ever was.

To my mind morphinism is a disease. It is also my opinion that being a disease that it belongs to us of the medical profession to deal with it. I do not say that there should be no laws dealing with morphinism. I do say that the law should be the servant of the medical profession and not our master.

We have a multitude of laws regarding the care of the insane. But for several years the medical profession have been master of the situation. The people have come to regard the medical profession as the rightful ones to have control of the insane.

Every well-educated physician knows that there was a time when the medical profession had but little to say or do with the insane. At one time all insane people were thought to be possessed by the devil. It was also thought that the ball and chain, and filthy jails were good enough for any insane person. I need hardly add that the profession and the laity were a long time in coming to take a rational view of the matter. Today the law is the servant of the profession so far as the care of the insane is concerned.

No one can be alienated except upon the advice of medical men. Medical men are given charge of the institutions for the care of the insane.

It has been learned however that no man is good enough, wise enough, or broad-minded enough to be given absolute power over another's person, without some judicious surveillance to see that he does not abuse his power.

With this exception the real care of the insane is given over almost entirely to the medical profession.

I can say that precious little is being done to see to it that the morphine addict is humanely treated.

No one thinks that the morphine addict is possessed by the devil. But so far as the treatment that he is getting is concerned the people of the country and many of our physicians might as well think that.

The majority seem to think that the addict is willfully guilty of criminal conduct. This results in about as much confusion as if it were thought that he was possessed by the devil.

So far as the management of the addict is concerned, I can see no ideal way of doing this that is likely to be put into effect in the near future. And why can I not see the near approach of the ideal management of the addict? I can not see any ideal solution of the problem in the near future because the ignorant laity are in control of the matter and not the medical profession. Morphinism is a disease and as such is beyond the comprehension of the laity and always will be. Morphinism is a serious disease. One of its most characteristic symptoms is the inability of the addict to free himself from his slavery unaided. So few ever do this that the general truth of the above statement is not affected.

Again another characteristic of this disease is the tendency to

relapse. These two features are as much a part of the disease as the irruption is a part of smallpox.

The direct cause of morphinism is morphine. This is something that should be remembered. Many think that only the neurotic are in danger of becoming addicted. This is dangerous teaching. It might lead those who are not neurotic to think that they could take the drug or leave it alone as they please. I have found as many of the phlegmatic temperament among my patients as those of the neurotic type.

Morphinism is a disease that may be complicated by other serious diseases like diabetes, nephritis, tuberculosis, syphilis of the brain or any other disease that may afflict the non-addict.

Morphinism of itself is serious enough to make the handling of it by laymen dangerous, or its perfunctory treatment by physicians dangerous. When it is complicated by any one of the above mentioned diseases it becomes doubly dangerous for any one but an expert to attempt its treatment.

I believe that no addict should be separated from his drug supply except upon the advice of at least one or better two competent physicians. But the powers that be will at once tell you that this will never do because there are bad men in the medical profession. Well what of it? Shall the ninety-nine be annoyed and hectored because of the one bad physician?

For I venture to say that the bad ones among us do not number more than one in a hundred. I think that it would be better to let the medical profession deal with its own unworthy members if such there be.

No physician likes to lose his standing with his fellows. If it should be found that one of our number was dealing in morphine commercially rather than professionally, we could and should bar him from membership in our societies.

I do not wish to cast any reflections upon any man or body of men, but I venture to say that the standing of the medical profession taking it as a whole is better than the standing of the government spies and informers. This occupation does not appeal to men of the highest type.

Again I say that the care and treatment of the addict should be left to the medical profession. I know that morphinism is a disease that does not appeal to the majority of physicians. I know farther that the medical profession do not know as much about it as they should know. But they and they only have the scientific training

that will enable them to master the subject. It is absurd to think that the laity will ever be able to solve the problem unaided by the profession.

So far as the management of the addict is concerned the laity are in the saddle. If morphinism is a misdemeanor they may in time find an ideal way of managing the addict.

I hold that it is not a misdemeanor, but that it is a disease. It is a disease that is not caused by a microbe. Neither is plumbism caused by a microbe, nor is chronic arsenic poisoning, nor chronic phosphorus poisoning.

These diseases are toxemias where the toxic material enters the system from without. Morphinism is of this same type. It differs from the above named diseases because morphine differs from the toxic agents above mentioned.

My teacher in anatomy, now long since deceased, often told us "anatomy is what the body is, physiology is what the body does, and pathology is what the body does incorrectly."

If this be true, then certainly morphinism is a disease. For the body of the morphine addict does many things incorrectly. In this disease the nutrition of the body is away below par. The emaciation of the body is in many cases equal to that seen in diabetes, nephritis, and often equal to that seen in tuberculosis. In morphinism the functions of the brain and nervous system are incorrectly performed. The excretion of toxins is sadly perverted and very incorrectly performed. If one doubts that the action of the brain is changed let him listen day after day to the conversation of addicts among themselves as I have done for several years; and I think his doubts, if he has any along this line, will be removed.

But before I can prove my contention that morphinism is a disease pure and simple I must prove that the addict is not responsible for not discontinuing his addiction. For of course the disease results from the continuation of the addiction. I hold that once the addiction becomes confirmed that the addict is not responsible for the continuation of his addiction. The addict rarely succeeds in freeing himself from his addiction. This is not because he never makes the attempt. Nearly all of them have made repeated attempts to do this. There is no use in looking all about for some easily prevented cause why the addict does not free himself.

The cause lies in the peculiar effects of the drug upon the body and mind of the victim. The reader may say that if he does not discontinue his addiction it is because he has too little sense. My patients are mostly of my own profession. I have treated many

physicians who had a better knowledge of medicine and surgery than I have. I have treated many who were professors in medical colleges. So the idea that the addict does not discontinue his addiction because of lack of sense will hardly hold.

I have said that the action of the brain was perverted in morphinism. By this I do not mean that the addict is insane. Especially if we take the definition of insanity given by an English authority: "A person is said to be insane when his mental operations are so far abnormal that he is unable to conform to the ordinary conventions of society in speech, manner, and actions." According to this definition of insanity I have not yet seen an untreated straight case of morphinism that I would say was insane.

Yet I do say that in practically every case of advanced morphinism, the mental operations are perverted. The lack of ambition, the inability to acquire new knowledge as readily as during the preaddiction period of the addict's life, the lessened persistence, the lessened ability for mental concentration over any long period of time, the morbid secretiveness, the tendency to seclusion, all these things point to a perverted mind. A perverted mind means disease. Perverted metabolism means disease. We find both of these conditions in morphinism.

Now I come to a study of the therapeutics of morphinism. The favorite treatment of the powers that be is to lock the addict up and take away his supply. I hold that this method is wrong even in those cases where it does succeed in permanently breaking up the addiction. It is wrong therapeutically because it is needlessly dangerous, because it is unnecessarily brutal, and lastly because it is founded upon the assumption that the addict is a criminal.

I should judge that there was some confusion in the minds of most persons as to what constitutes a crime.

Have our lawmakers the right or the power to say what shall constitute a crime? Are we to believe that they can do no wrong just as our forefathers believed that the king can do no wrong? I should say that the lawmakers' power in this respect was altogether assumed. I should say that it was something in the inherent nature of an action itself that should determine whether the action was criminal or not.

All the power our lawmakers really have is to declare a certain action illegal. Too many are ready to jump to the conclusion that any illegal action must of course be a criminal action. My experience leads me to believe that there is such a thing as breaking an addict's spirit and courage to that extent that even if the addict be-

comes cured after passing through what the powers that be think is good enough therapeutics for him, that he will never make as good a citizen as he would have done had he been treated by some more kindly and humane method. I treat the addict without the use of restraints of any kind. I have tried to cure a number of causes where the government or the state had failed by the use of their harsh methods. In not one instance have I met with success. This in spite of the fact that I have been entirely successful with many cases where the addiction was of more than thirty years' duration, and a few cases where the addiction was of more than forty years' duration. The duration of the addiction among these cases that had been mistreated by the authorities was not in any instance more than ten years. I failed in securing cure of these cases, because in my opinion their courage had been so completely broken that they were not fit subjects for my treatment without restraints.

I hold that throwing an addict into jail and removing his drug by force is dangerous to both life and reason.

I may be mistaken in this. I am waiting patiently for the powers that be to publish an honest report of their results in order that they may disprove my statement if they can. *I think that I will have to wait a long time.* For I fancy that such a report would not make good reading. Even if their results were good so far as stopping the addiction is concerned, any man's business and social standing must be injured by serving time in jail. If morphinism is nothing more than a disease this is a crime.

The government or state idea of treating morphinism is not ideal. And to my mind neither is its management of the addict ideal. The treatment of the addict in jails and prisons is not constructive even when it brings about a cessation of the addiction, and it seldom does. So far as the best interests of the addict is concerned it should be our business to restore him to the position in society that rightfully belonged to him before he became an addict. The addict and his friends are not the only ones interested in this, society as a whole is interested. For a good citizen is always worth more to society than a useless one.

If the laity have found no ideal method of treatment how about what we of the medical profession are doing along this line? The divergence of views that obtain among us is proof enough that we have not yet found the ideal method of treatment. This, however, is no cause for discouragement. We are curing cases of morphinism every day.

There is no single method that is ideal for all classes and kinds

of cases. The treatment that I generally use is, I think, ideal for the class of cases that I would prefer to treat. Unfortunately we can not always select our cases.

The type of cases that I would prefer to treat are those who have been well disciplined. It does not make any difference whether this discipline has been self-applied, or received at home, at school or in any other way.

The man who was once a poor newsboy, who has raised himself from this humble position to one of responsibility, would be likely to make an excellent patient for my method should he have the misfortune to become an addict.

The very fact that he has succeeded in doing this shows that he has exercised self-denial, persistency of purpose, and has administered to himself a rigid self-discipline.

The physicians whom I have treated usually made excellent patients. The discipline that they must have received in getting their preliminary education, their medical education, and lastly the self-denial needed to work up a practice, fitted them well for the part they played in coöperating with me to secure their freedom. I treat my cases by gradual reduction without the use of restraints. So the reader can readily see why I lay such stress upon preaddiction discipline.

I prefer this method when I get the right sort of cases for its application, because it helps to build up the addict's self-respect and self-confidence.

In other words I like this method because it is constructive and not destructive. It helps to put the addict into that position in society that once rightfully belonged to him.

Seven of my cured cases became officers in our Army and Navy. This shows that the addict is not hopelessly injured by his disease; and it shows that he can come back.

So far as playing the game on the square is concerned I leave that to the patient. I think that this is a form of self-discipline that is needed to bring about the best constructive results. I want my patients to feel that they have had a very large share in bringing about their cure.

This is very helpful to their self-respect. Without self-respect a man is nothing. Of what particular use is it to cure an addict if he is turned loose minus his self-respect?

One of the objections to gradual reduction without restraints is that it is not an easy method to learn or to apply. A peculiar personality is needed to enable one to get the addict's confidence, to

build up his self-respect, his pride, and hope of good things in the future.

Unless we can do this the addict is not likely to put up much of a fight.

Again I like this method because extreme shock and danger are avoided. The reader well knows that the diabetic, the nephritic, the patient with syphilis of the brain, and the tuberculous have but little resisting power.

I have succeeded in dealing with cases that were complicated by one of the above mentioned serious diseases. At different times I have met with all of these complications. And in no case have they hindered me from freeing the addict of his addiction. This of course means that it is possible to handle this method in such a way that there is but little strain placed upon the patient's vital powers of resistance.

It needs experience to learn the dosage. The proper guide in making the reduction is not the patient's pulse, respiration or general well-being, but what we have learned from past experience that these cases will voluntarily stand.

So it becomes necessary to size up about what sort of a patient with whom we have to deal. We need not learn what sort of a body he has so much as how much courage and fight he has in him. It often happens that an addict, who is but little better than a living skeleton, has the courage and the will to fight, while a robust-looking addict lacks these qualities to a large extent.

Of course we all know that morphine plays the very dickens with an addict's courage. Still if we learn from his history that he has accomplished something in life there is a lively hope that he may do so again.

On the other hand, if his history shows that he amounted to nothing during his preaddiction period of life, gradual reduction without restraints is not an ideal treatment for his case.

The treatment of morphinism by gradual reduction without restraints is as much a matter of psychiatry as it is a matter of physical therapeutics. The underworld does not give us a type of addicts that we can treat without restraints by gradual reduction or any other method. Even where restraints are used the results are not likely to be very good.

Morphine lessens ambition. This is just as true of the burglar as it is of the clergyman. I have often thought that so far as the underworld was concerned that society would be far better off if there were no anti-narcotic laws in existence. I would say let those

of the underworld take all the morphine they want to take. The more they take the less deviltry they will commit. The harder and more expensive it is for them to procure morphine the more they will have to steal or swindle the public out of in order to get along. The advanced morphine addict does as little as he possibly can, whether it be stealing or shoeing horses.

There is still another class of cases that my treatment is not well fitted for and that is those cases who have become utterly irresponsible, through multiple drug and alcohol taking.

I have treated many of these cases successfully. However, I have met a number of them where the results were not very good. The reason for this is not very hard to find.

They are too irresponsible to coöperate with one by playing the game on the square. They have too little mind left to profit by one's teaching. They will agree with you readily enough while you are talking. They forget too soon. They need kindness and restraints over a long period of time. Often this can not be done for them, because they lack the means to pay for the extra care needed.

There is also a very large number of cases, perhaps the majority, who have not the means to pay a physician for the time needed for a properly conducted gradual reduction. Further the public does not seem to be disposed to pay for the time needed to make this method of treatment successful.

What then can we do for this class of cases? I see nothing better than to use some of the "quick methods" of removing the drug. If we have in mind the complete restoration of the patient to health and strength the "quick methods" consume more time than gradual reduction.

However, the addict can wait for complete convalescence in his own home. Ideals are seldom entirely attainable. But the "quick methods" of removing the drug can be made more comfortable and more safe for the patient.

Hyoscine or some other mydriatic is usually used in these cases. A great many are afraid of hyoscine. I think that if it is remembered that hyoscine is not a specific for morphinism but that it is a convenient anesthetic for use in these cases, that much of the danger may be removed. It should be given with the same care that is used in giving any other anesthetic.

Enough should be given for the purpose in hand and not a bit more. The bowels should be thoroughly unloaded before the morphine is stopped. In the morning of the day that it is proposed to give the last dose of morphine give a large dose of sulphonal. At

10 P.M. give the last dose of morphine. An hour later give a full dose of hyoscine; at the same time give a dose pilocarpine and eserine.

Those who have had experience have learned that these two drugs used in conjunction with hyoscine make the latter drug much more comfortably borne by the patient.

The delirium and tossing about is very nearly absent. No more hyoscine should be given until it becomes apparent that the patient needs it. Regular hours for giving hyoscine is entirely wrong in these cases. If you start out in this way you have your patient asleep in the beginning of the treatment. It takes less hyoscine to keep him asleep than it would take if you were to wait until he begins to suffer sharply for want of the drug. Vomiting is so often present in cases treated in this way that the hypodermic method of administering the doses is preferable.

Hyoscine has to bear the blame for symptoms that I do not think are caused by this drug. I have seen complete dilatation of the pupil in cases where no medication was used.

I have seen under the same circumstances hallucinations and even delusions. I believe that the worst of the symptoms are caused by the withdrawal of the drug. I think that hyoscine properly given renders the treatment more safe rather than more dangerous. To a certain extent it overcomes the shock. And certainly it lessens the mental and physical suffering.

There is yet another method that may be used, although not ideal in my opinion. This is a week or ten day reduction. The bowels need the same attention here as in the other treatment. The doses of hyoscine, eserine, and pilocarpine being given over a longer time should be much smaller. This method I think is the safer of the two, but not likely to be any more comfortable for the patient. I doubt if it is as comfortable. There is not time given for the body to adjust itself to the withdrawal of the drug.

Suggestion I believe is a valuable adjunct to the treatment of morphinism. In neither of these two methods is the patient in the right mental attitude to profit by suggestion.

Further in these two methods the patient is so decidedly not at all his usual self, that these methods afford the physician but little opportunity to study the psychology of morphinism. This last is something that I think adds very much to one's equipment for this work.

In conclusion I will say that gradual reduction is the nearest to an ideal method that we have.

If the dosage is correctly learned the patient can be kept as comfortable as while using the drug *ad libitum*.

It gives the body time to adjust itself to the change. The convalescence is much more rapid. The danger of relapse is certainly much less.

• It is the most constructive method that we have. It is the most likely to restore the addict to complete health and usefulness.

The "quick methods" often leave the patient mentally impaired, though not completely insane. One of the most characteristic features of this state is that patient is unable to exercise mental concentration over a long period of time. Hence his earning capacity is lessened to a considerable extent, especially if his occupation calls for this sort of thing.

The morphine addict is a sick man. Locking him up in jail is not an appropriate treatment for him. This way of dealing with one who is a chronic invalid is not only not ideal, it is altogether out of harmony with the supposed civilization of the twentieth century. We have no ideal method of treatment that can be applied to all classes of cases. If we can not use an ideal method we can use the best possible method under the circumstances in each case.

Society Proceedings

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, OCTOBER 21, 1920

EVERETT FLOOD, M.D., President, in the Chair

THE INFLUENCE OF THE CEREBRUM ON GROWTH

DR. A. MYERSON'S paper dealt with the infantile hemiplegias, the spastic hemiplegias occurring in infancy and in fetal life. It has long been known, though not to any great extent has it appeared in the text books, that when the cerebrum is injured in fetal life by hemiplegia or inflammation a limitation of the growth of the side of the body governed by that portion of the cerebrum takes place, the limbs tend to be shortened, the bones thinner and the face is asymmetrical. The ear and the breast are not included, although in certain cases the ear and the breast on the affected side are smaller. It includes the diameter of the chest on the affected side which is always less. The scapula and the clavicle are always shorter. X ray pictures show no particular pathological phenomena, although some of the x rays taken show that the ossification process seems to lag behind on the affected side.

The classical work on this subject was done by Freud, who collected all the literature on this subject. It is a rather interesting commentary that Freud's first researches were in the field of physical injuries in fetal life. His later contributions were on the psychical injuries in fetal life. Perhaps there is a connection here beneath the surface. The phenomena to which this paper calls attention are, first the contrasting conditions of the hand in adult and infantile hemiplegia. In adult hemiplegia there usually develops a spasticity very marked in the fingers, the typical hemiplegic hand. On the contrary, in the infantile hemiplegias there is *hypotonia most marked and constant*. This seems worthy of notice: first, because the rule in infantile hemiplegias is contrary to the rule in adult, and second, because it is a constant phenomenon and practically never absent in some degree or other. It is therefore one of the ways of differentiating between infantile and adult hemiplegia.

Another phenomenon concerns the scapula. William Graves, of St. Louis, has made his life work the study of the condition known as the scaphoid scapula, a condition in which the ordinary convex vertebral

border of the scapula is concave in construction, the angle of the spine of the scapula is changed and the bone itself is smaller and thinner. In his early papers he laid some stress on syphilis as a cause, but now he looks upon the condition as a phenomenon of general pathology. Critics of his work have stated that the shape of the scapula is dependent on use and that the concavity is brought about largely through use. The series of cases which were studied at Dr. Fernald's institution, Massachusetts School for the Feeble-minded, showed that the arm and leg may be completely paralyzed and there may be no function on that side, and the scapulae will be shorter and thinner. They will, however, be the same in shape on the affected and the unaffected sides. If the scapula is scaphoid on the sound side, it is the same on the paralyzed side. If the scapula is normal, so-called, on the sound side, it will be the same on the affected side. In other words, the shape of the scapula does not depend on use, which is exactly Graves' contention.

OPPORTUNITIES FOR CREATIVE EFFORT BY THE MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE

DR. A. W. STEARNS noted that the Society for Mental Hygiene in this state was one of the first to be organized. It has been an important factor in the development of the National Committee for Mental Hygiene through its membership and its opportunity to help because of the fact that Massachusetts is so far advanced in these matters. In fact the question has been raised as to whether there is a place in a state so highly organized as Massachusetts for a private society for mental hygiene. This question can be answered in the writer's opinion in the affirmative.

There are many fields of activity which a private society can enter quite apart from those covered by a state organization. However, the excellent development of our state organization makes the function of the Massachusetts Society for Mental Hygiene quite different from that of those in some other states.

Some of the directions in which future effort should take are: (1) To create and maintain an enlightened public opinion concerning the relations of mental normality and abnormality to a useful life in the community. Mental disease and psychology are still surrounded with mystery in the minds of the general public. One of the greatest handicaps of mental disease is the attitude which even the most enlightened people take toward it. Efforts at propaganda by state departments often arouse suspicion on the part of the public. There have been occasions in this State during the last few years when resentment has been created by proper attempts of state organizations to stir up public opinion. A private society organized primarily for educational purposes does not meet this opposition. There is little occasion in this state to conduct a cam-

paign concerned primarily with institutional care of the insane, but public opinion is still archaic in its attitude toward the insane or the defective person in the community. It is surprising to find the number of intelligent people who think that many of the insane are kept in institutions by their relatives in order to get their money. The attitude of the public toward an insanity plea in court is hardly intelligent. Again, a failure to recognize the need of adjustment in society for the aged and psychoneurotic leads to broken home ties, divorces and endless litigation. There is evidence to show that the suicide rate can be influenced by propaganda.

(2) To maintain the highest standard in our state institutions. This Society should be in an independent position enabling it to commend or criticize when such action is for the best.

(3) To foster research and investigation tending to increase the knowledge of this subject and in that way ultimately to reduce burdens. Every man in this state who develops a new or promising idea if practical, should feel that the Society stands ready to lend its assistance. The routine duties of the state service and the tremendous problem of feeding and housing so many dependents occupies the major part of the time of those officially dealing with the insane, thus a society of this sort may well conduct or patronize research.

(4) To extend the investigations now being made in a few centers on the relation between mental disease, personality and crime. There is a tremendous field for mental hygiene in the administration of justice and the practice of law. The good beginnings in this field should be supported and new ones developed.

(5) To take an advanced stand concerning the prevention of feeble mindedness. The general question as to segregation, sterilization and control of reproduction of the feeble minded can perhaps best be answered and leadership assumed by a private society.

(6) To extend special classes now so successful in a few places. Laws have been passed and state bureaus are now engaged in work with the defective and backward in our schools. The public must be prepared for this innovation by being informed and encouraged to use special classes properly.

(7) To formulate and to carry out organized effort for the care of the handicapped in the community through social service. The last fifty years have been characterized by a tremendous institutional development. The public is now willing to trust the handicapped one to the care of an institution, but further extension is almost prohibited by the question of expense. There are signs everywhere that the contribution for the next generation may be for economical reasons the perfection of community care of the handicapped. Experience has shown that private agencies dealing with a few cases in a personal way can often develop a method more readily and carry on experiments with

less risk than can the more cumbersome machinery of a governmental department.

(8) To promote the establishment of courses on mental hygiene in the professional and normal schools. There are many colleges in Massachusetts where courses in hygiene are given. These courses have largely to do with the body and should include the mind. Physicians, lawyers and school teachers are continually going forth to their work with too little equipment along these lines. The urge to greater effort may well come from our Society.

(9) To emphasize the need of mental hygiene in the industries. Individuals succeed or fail according to their mental capacity and ability to adapt themselves to their work. Business houses and industries are employing almost any sort of a person who thinks he can help. This field should be gone over, studied and the fundamentals made matters of routine.

Lastly, there are in this state a great many individuals who are professionally or otherwise engaged in work related to mental hygiene. These individuals should be organized, kept informed and asked to advise and so become a greater factor in the progress of our State. Among these are included clergymen, lawyers, doctors, philanthropists, teachers, employment managers, social workers and innumerable others who may be given an opportunity for self expression which can be offered through membership in a society for mental hygiene.

IMMIGRATION FROM A MENTAL HYGIENIC STANDPOINT

DR. A. J. NUTE said that the earliest migratory movements were due to a class of people who are known as colonists as well as immigrants who sought a haven in order to benefit themselves from an economic point of view and largely to have freedom of religious privilege. This migratory movement of a late day has changed so that instead of seeking political rights or religious freedom many are quite ignorant of the simplest facts regarding the government under which they formerly lived and are very apt to confuse the American flag with the dollar bill. The colonist may be classed as an immigrant who is willing to go out and endure the hardships of climate, famine, disease and hostile Indians in order to gain a home and his freedom. The immigrant may do that but he is more likely to profit by what the colonist has started. Therefore the present day tendency is to settle in the cities where it is usually easier to live under conditions more or less satisfactory. In the early settlements selection was the rule by kindred spirits flocking together. Later, as the country grew, the selective element changed and a restrictive policy had to be enforced. The earliest laws passed by the United States were largely to protect the immigrant. This was from 1819 to 1882. From then on laws have been passed largely to protect the United

States. In the early days each state had to protect itself as best it could. This was very unsatisfactory without national action because only Congress could regulate commerce with foreign countries. New York took the lead and finally Congress was induced to take such steps as would start an organized, uniform immigration policy. At first this was carried out by the states by agreement with the Government. In 1890 the Federal Government assumed control itself and from that time on the laws have been gradually tightened in order to exclude the more undesirable types and at the same time to protect the desirable.

Traveling in the early days of the sailing ship was a hardship but little appreciated today. The immigrant furnished his own food and a death rate of ten per cent. during the voyage was considered normal. From time to time the various countries improved these conditions so that before the days of steamships it was required that immigrants should be provided with certain space, certain food, and some protection in regard to sanitary matters and the competency of ships officers. From the days of steamships the general sanitary and living conditions have improved until at the present day the so-called steerage travels better than the cabin passengers of one hundred years ago. Upon arrival at the immigration station means are taken to protect his rights and interests.

In regard to the laws relating to mental inspection it has only been a comparatively short time that mental defectives were mandatorily excluded. The feeble minded might enter legally up to 1907. Under the laws of 1882 idiots and the insane were the principal mental defectives excluded. In 1893 the law was tightened relative to information in regard to arriving aliens. In 1903 epileptics and persons who had been insane within five years and persons who had had two or more attacks of insanity were barred in addition. In 1907, in addition to the foregoing, a person having a mental defect that might affect his ability to earn a living was excluded and for the first time a penalty was placed on the steamship company bringing such mental defectives as idiots, imbeciles and epileptics. Provision was made also to deport any alien that entered the United States in violation of the law or who became a public charge from causes existing prior to landing at any time within three years after date of entry. The last act of 1917 added constitutional psychopathic invalidity, chronic alcoholism, those having had a previous attack of insanity at any time and persons not coming under the above departments that can be classed as mental defectives. The alien was given the right to appeal when certified for a mental defect and allowed to present one medical expert in his behalf before a medical board. The penalty or fine to the transportation company was increased and in addition the deported alien was entitled to have a refund from the transportation company of a sum of money equal to that paid by him for transportation from the port of departure to the port of arrival.

The provision made to deport any alien was extended from three to five years and the wording changed from "causes existing prior to landing" to "cause existing not affirmatively shown by himself or friends to have arisen subsequently to landing."

The inspection may be likened to a sieve rather than a dam. The immigrant has had at least one and maybe several examinations prior to embarkation. A well trained examiner can tell at a glance the nationality or race of the individuals that appear before him. This is a necessary step in order that he may know or recognize the normal from the abnormal. Those detailed are examined in a quiet room after twenty-four hours rest. Physical examinations are made to make allowances for physical defects. A brief mental examination to ascertain the amount of acquired knowledge the alien has and to test his mental activities is given and if successfully passed the next suspect's case is taken up. By this method the normal are released with as little delay as possible. Examinations that follow are made by at least two doctors on different days and a certificate is issued when all agree as to the findings. As long as doubt exists reexaminations are made.

DR. DONALD GREGG remarked in discussing this paper that on ship-board it was extremely interesting to watch immigration inspectors quickly go over two or three hundred people and by simple observation pick out physical and mental defects. He asked Dr. Nute to mention more specifically the general signs that an inspector would look for in examining several hundred men.

DR. A. W. STEARNS objected to the inference that we were all immigrants. The publicity that has been given during the last year to the early history of this country would tend to show that this is not so. Several have attempted (Dr. James J. Putnam in particular) to define or describe the New England character. The population of New England was not an immigrant population but grew through reproduction. For a period of twenty years about 20,000 people came to this country and then, with the exception of the Scotch Irish, immigration stopped. As many returned to Europe as came so that for nearly two hundred years the increase of population was by reproduction. This was also accompanied by extreme isolation. There were no large cities and the settlements of colonists were widely separated so that a type grew up which has become quite distinct from the immigrant type. Dr. Stearns also suggested that great differences of mentality in children and illiterates could be detected by skilled observation of the facial expression and manner. He has found this to be true in his experience with the lowest type of Southern negro.

DR. A. J. NUTE in answer to Dr. Stearns said that it was very true that facial expression was a guide to intelligence. For instance, if an intelligent immigrant child of about two years is brought into a room

hung with bright flags his passive expression at once will change to an animated one. A simple toy will give the same result. In reply to Dr. Gregg's question, an experienced inspector must be familiar with the types of people he examines. He must be able to tell at a glance the nationality of the man passing before him. If he cannot do this he is not a competent examiner. The stolidity which is to be expected in a Pole, for example, might be indicative of a dementia in an Italian. If an Italian woman had the flush of a Scandinavian she would be taken aside to see if she had a temperature. Again, the immigrant dresses in his best when he comes into port. He wants to make the best showing he can. If one comes along carelessly dressed and appearing indifferent it immediately attracts attention and it is well to investigate the mental attitude of that person. In the old days all that could be detected were the gross defects. Now the gross defects are fairly well eliminated on the ship and there is time to devote to the finer defects. This fact is responsible for the large increase in the detection of the mental defective.

Current Literature

II. SENSORI-MOTOR NEUROLOGY

7. NEUROSYPHILIS.

Lisser, H. THE TYRANNY OF THE WASSERMANN TEST. [Journal of Cutaneous Diseases, November, 1919, Vol. XXXVII, pp. 754-758.]

For several years it has been preached and considered sound medical practice to be guided and controlled in the treatment of syphilis by the Wassermann reaction. So long as a patient's Wassermann reaction remained positive, so long must he be energetically and persistently treated until the blood test became negative and remained negative. Should the Wassermann reaction slip back to positive after it had once become negative, such regrettable occurrence was held as an immediate indication for the resumption of treatment. No syphilitic could be considered clinically cured unless serologically cured. Clinical judgment was to be firmly controlled by so-called laboratory accuracy. The incessant repetition of this doctrine by authority after authority, has indeed brought about considerable improvement in the treatment of syphilis. By and large such patients are more thoroughly and vigorously salvarsanized and mercurialized, and for a longer time, than heretofore. Great good has undeniably resulted from this worship at the shrine of the Wassermann reaction. The Wassermann test is a tremendous aid in the diagnosis of syphilis where careful clinical examination is unable to uncover any signs or symptoms of the disease. This fact is obvious and needs no elaboration. Fortunately, a fair majority of active, infected syphilitics give positive Wassermann reactions. But it is equally true that a respectable minority, and by no means a negligible group, of active syphilitics give a negative response to complement fixation. When one is confronted with such a fact, how can one logically claim that a negative test after treatment denotes a cure? *If one patient having a negative test nevertheless requires active treatment how can it follow that another one be cured because his test is negative? That the occurrence of negative tests in active syphilitics is only occasional does not destroy the inconsistency of any argument that bases clinical cure on negative Wassermann reactions.*

A greater problem, however, that confronts us in guiding treatment by the Wassermann test is the persistently positive Wassermann reaction, and as clearly pointed out by Wile, these cases formerly in the minority, are now steadily on the increase, as the Wassermann test is

being made more sensitive. It becomes therefore constantly and increasingly more difficult to bring about negative Wassermann reactions by treatment. Is it after all desirable that the Wassermann reaction become negative? What does it indicate when it becomes negative? I have pointed out above that it cannot denote a cure, because cases that are definitely in need of treatment are sometimes negative to the Wassermann test.

When the Wassermann reaction remains persistently uninfluenced by treatment, even after fifteen or twenty salvarsan injections and several courses of mercury salicylate injections, the patient and the physician both become profoundly discouraged. A report on a piece of paper from the laboratory will shake all confidence in clinical success. The patient may be in the best of health, show absolutely no signs of symptoms of the disease and have had thorough treatment for three years or more, but the Wassermann report will overshadow all such considerations and insistently call for more and more treatment until the treatment is far worse than any symptoms from which the patient has suffered. The mental and emotional depression consequent on this faith in the infallibility of the Wassermann test, exerts a sinister influence on the patient's daily life.

Thousands and thousands of patients were cured of syphilis for all practical purposes and lived to a reasonable age before the Wassermann test was devised. Probably most of them would have shown positive Wassermann reactions with the delicate, sensitive methods of today. This is no criticism of the Wassermann test, which none of us would do without. It is a criticism of the hypothesis that clinical cure depends on serologic cure. I admit that clinical judgment is by no means accurate, and that an arbitrary rule that syphilis requires two or three or four years' treatment is but a crude method of controlling the disease, but this is no excuse for permitting ourselves to be deceived by a false sense of security in the Wassermann test. *Too implicit faith in the sensitive Wassermann test is fast driving us into an excess of treatment*—for as Wile aptly remarks, to attempt to convert positive into negative Wassermanns, is in the majority of cases, "chasing a shadow."

CONCLUSIONS.

1. A strongly or definite positive Wassermann reaction is undoubted evidence of syphilis.
2. It is an invaluable aid in the diagnosis of syphilis, especially in those cases where physical diagnosis does not reveal positive evidence of the disease.
3. A negative Wassermann means exactly nothing. (a) It does not prove the absence of syphilis, because negative tests occur in cases urgently requiring treatment. (b) Therefore it cannot denote a cure in treated cases.

4. A positive Wassermann reaction means syphilis, but not necessarily active syphilis.

5. Once the diagnosis of syphilis (after the primary stage) is established, the patient should be properly treated from two to four years, depending on the stage of the disease and the severity of the lesions.

6. Treatment should be entirely independent of the Wassermann reaction, because negative Wassermann reactions sometimes occur prematurely during treatment, while positive Wassermann reactions frequently persist long after clinical cure.

7. Once the diagnosis of syphilis is positively established, the fewer Wassermann tests done the better, both for the peace of mind of the patient and the physician.

8. The Wassermann test should be employed as an aid to clinical judgment, but not to supplant clinical common sense. [Author's abstract.]

Eskuchen, Karl. THE CLINICAL VALUE OF COLLOID REACTIONS OF THE LIQUOR CEREBROSPINALIS. [Neurol. Centralbl., July 16, 1918, No. 14, Vol. 37.]

The methods suggested for the examination of the cerebrospinal fluid continue to increase in number. The real reason for the untiring search for new methods is the fact that all previous reactions fail more or less of their object, for, no matter how sensitive they are, they fail to act specifically; that is to say they show that disease is present and also, to a great extent, to what degree, but they give absolutely no clue to the special etiology. Thus, for example, there is increase of globulin or pleocytosis in affections of the nervous system of most widely different nature, so that it is impossible to distinguish from the reaction the difference between a luetic and non-luetic infection. Only the Wassermann reaction with its specific result can give the differential diagnosis, but the disadvantage of the Wassermann test is that it is only moderately sensitive. For any pronounced case the result is usually positive, yet the percentage of failures where the phenomena are not extreme is relatively high. And these are the very cases in which, to establish the diagnosis, a specific reaction is indispensable. The extreme enthusiasm, therefore, with which the announcement of the discovery of the gold reaction was received may be easily understood. It seemed at first that this was a reaction which in all cases not only permitted the luetic disease of the central nervous system to be distinguished from the non-luetic but also the different forms within these disease groups to be distinguished from each other. However, disillusionment followed quickly enough, and the disappointment was so great that the real advantages of the test were obscured. Nevertheless this test has great usefulness if only the limitations are rightly understood and too much is not demanded of it. The colloid reactions, of which the gold reaction

is the typical representative, have increased to three and the question arises, which of these is the most serviceable and reliable for general use—the gold reaction, the Mastix reaction, or the Berlin blue reaction. From the point of view of its earlier technic the Berlin blue is the best of the colloid reactions. The preparation of the reagent is not difficult, the reaction is easily obtained, and the results are clear. For the gold and Mastix reactions the advantages and disadvantages of the technic balance very nearly and the necessity of repeatedly testing the preparation, the difficulty of interpreting the variations in the results, etc., render both rather difficult to apply. But the advantages of technic of the Berlin blue reaction are not in keeping with its disadvantages when it comes to usefulness. The results show only quantitative differences, though wherever the central nervous system was intact, in the author's cases, the result was negative. The gold reaction, on the other hand, gives qualitative reactions. The percentage of results indicating the relative sensitiveness of the reagents were, in the author's experiments as follows. The Mastix reaction showed in luetic affections of the central nervous system (111 cases) 92.5 per cent. positive results, the gold reaction 98 per cent. The Mastix reaction in paralysis (29 cases) was positive in 100 per cent., the gold reaction in 100 per cent. In lues cerebrospinalis (30 cases) Mastix was positive in 85.5 per cent., gold reaction 96.8 per cent. In tabes (52 cases), Mastix positive in 90 per cent., gold in 98 per cent. A point of interest is the number of times the type of the curve in the gold reaction corresponds to the special form of the luetic disease, *i.e.*, paralysis 100 per cent., lues cerebrospinalis 76.5 per cent., tabes 81 per cent. From the Mastix reaction an analogous division of the diseases in accordance with the character of the curves could not be made, and it is remarkable that with this test tabes reacts in such a variety of ways, sometimes wholly like paralysis and at other times in such a way that the curve of the disease cannot be distinguished from the curve of secondary lues. As a rule the gold reaction was superior, giving a typical and adequate reaction where the Mastix ceased to act at all or only gave obscure results. The results of the practical application of the various colloid reactions may be summed up as follows: The Berlin blue reaction may be excluded from consideration for regular use because, as a purely quantitative reaction, it gives no clue to the specific character of the disease. The Mastix reaction and especially the gold reaction are to be preferred because of their high sensitiveness and because the special character of their curves though very easily influenced by contingent circumstances still permits luetic diseases to be distinguished from non-luetic in some cases where even the Wassermann fails. The gold reaction also permits the luetic diseases to be distinguished to a certain degree from each other, and with less certainty the non-luetic. Practically the ambiguousness of the result in multiple sclerosis is the one which gives rise to most difficulty. This affection

reacts like lues so that it is impossible by means of the colloid reaction to differentiate the two diseases. Though the colloid reaction is not an ideal one, it must nevertheless be resorted to for diagnostic purposes. To the "four" reactions should be added the colloid reaction as the "fifth" to complete the circle, for even with its contingent specificity the reaction is a very valuable one, leading to a much higher degree of certainty in diagnosis.

Raabe, A. COMPARISON OF WASSERMANN AND SACHS-GEORGI TESTS. [Berl. kl. Wochenschrift, Oct. 27, 1919, J. A. M. A.]

Raabe reports the results of a series of comparative Wassermann and Sachs-Georgi tests, and gives a detailed description of the modified technic for the latter. It is applied with physiologic sodium chlorid solution and natural cholesterinized organ extracts. Of the 1,750 parallel tests, 569 were positive by both the Wassermann and the Sachs-Georgi reaction, while 1,005 cases were negative by both tests. Of the 569 positive cases, 519 had been clinically diagnosed as unquestionably syphilis. In view of the close agreement between the results secured by the two methods, the writer concludes that, from the standpoint of diagnosis, therapy and prognosis, the Sachs-Georgi precipitin test deserves ample recognition, but she does not think that it can be regarded, even with its simplified technic, as a substitute for the Wassermann reaction. Its value as a control of the Wassermann reaction is, however, already established.

Wolffenstein. PRACTICAL VALUE OF THE SACHS-GEORGI REACTION. [Berl. klin. Woch., November 24, 1919.]

This investigator has observed a large proportion of non-specific results with the Sachs-Georgi reaction. He has used an extract prepared by Sachs as well as others prepared by himself according to the Sachs method. Two of his own extracts, which on preliminary testing appeared reliable, were submitted to a thorough comparative investigation on 1,000 cases. Occasionally it was observed that one or other of the extracts would give bad results on one day, while tested with the same serums on the following day it gave correct readings. This accidental variation appeared to depend on some slight difference in the method of preparing the emulsion, but the exact factor concerned could not be defined. In cases known to be syphilitic the Sachs-Georgi reaction was more frequently positive than the Wassermann reaction, the difference being especially marked in early primary cases, in latent cases, and in treated secondary syphilis. On the other hand, a positive Sachs-Georgi reaction was wrongly obtained in 22 out of 230 non-syphilitic cases, and in all of these the Wassermann reaction was negative. Non-specific results occurred, especially in febrile diseases. In view of this the author considers the test in its present form as of less practical value than the Wassermann reaction.

Plaut, F. THE SACHS-GEORGI PRECIPITATION REACTION WITH SPECIAL REFERENCE TO ITS USE WITH THE CEREBROSPINAL FLUID. [*Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1919, 52, 193.]

To avoid the difficulties associated with the Wassermann reaction a number of other precipitation methods have been devised. These nearly all depend upon the precipitation of the serum-globulin, it being known that these globulins are more easily brought down from a syphilitic serum than from a normal serum. The serum-globulins of other diseases have, however, the same characteristic, and thus these reactions are not specific. An attempt has been made to cause a more specific precipitation of the syphilitic globulins by means of the lipid antigen, and this was found to occur, not visibly to the eye but to the ultra-microscope. Sachs and Georgi then made use of cholesterin with the antigen, as done in the Wassermann reaction, and much more specific results were obtained. The author tests this method upon neurological cases. The technique is to make a 1 in 10 dilution of the patient's inactivated serum or cerebrospinal fluid with saline and a 1 in 6 dilution of the cholesterinized antigen. Two parts of serum are mixed with one part of antigen and placed for 2 hours at 37° C. and 10-12 hours at room temperature. 500 sera were tested and in 90 per cent. the results agreed with the W.R. On analysis of the syphilitic cases which disagreed, it was found that the W.R. was more often positive in old cases and much more often in congenital cases. The Sachs-Georgi reaction (S.G.) however, appeared to remain longer positive after treatment than the W.R. With regard to the apparently non-syphilitic cases (all neurological) 11 gave a positive S.G. and negative W.R., but the author considers these to be too few in number to register the reaction as non-specific. 158 cerebrospinal fluids were tested and 87 per cent. agreed. In every case the disagreement was due to a negative S.G. The S.G. did not correspond to the cell count or to the globulin or gold-sol. reactions. In every case it is essential to use large quantities of cerebrospinal fluid, namely at least 6 times as much as serum. The author then discusses a number of means by which the intensity of the reaction may be increased, but concludes that any increase is at the expense of the specificity.

Gallivalerio, B. SACHS-GEORGI TEST FOR SYPHILIS. [*Corresp.-Blatt f. Schweizer Aerzte*, Dec. 25, 1919.]

The test proposed by Sachs and Georgi in 1918 is highly thought of by the author, who believes it may supersede the Wassermann test, at least to some extent, as its technique improves. It is based on the observation that a precipitation or flocculation, more or less great, of the globulin is produced in a mixture of syphilitic serum with a cholesterinated organ extract. The organ extract is made from 100 c.c. of an alcoholic extract of beef heart, one gram of heart to five c.c. of alcohol,

200 c.c. of alcohol, and 13.5 c.c. of a one per cent. alcoholic solution of cholesterin. At the moment of use one part of this extract is mixed with one part of 0.85 per cent. physiological solution, agitated, and then four parts of the same solution are added. An opalescent liquid results. The serum to be tested should be fresh, clear, sterile, and inactivated by heating for half an hour at a temperature of 55° or 56° C. To one c.c. of the patient's serum, diluted ten times with the 0.85 per cent. saline, is added 0.5 c.c. of the extract diluted as above indicated. The whole is well mixed, incubated at 37° C. for two hours, and then kept at room temperature for twenty, twenty-four, or forty-eight hours, after which the findings made be recorded. Meyer suggests shortening the time by centrifuging the tubes after three or four hours' incubation. The precipitation may be estimated by placing the tubes slanting on the black background of a Leitz dissection microscope and examining with a number eight glass, which renders the use of an agglutinoscope unnecessary.

Sicard and Roger. CEREbro-SPINAL FLUID IN GENERAL PARALYSIS. [Bull. et Mém. Soc. Méd. Hôp. de Paris, XLII, 1918.]

Sicard and Roger have systematically examined the cerebro-spinal fluid in more than 100 cases of general paralysis, since 1913, in relation to the Bordet-Wassermann reaction before and after treatment by intravenous injections of arseno-benzol. Their chief finding is that, in general paralysis, the reaction of the spinal fluid cannot be rendered negative, even after intensive treatment with arseno-benzol; whereas the reaction of the blood, on the contrary, often becomes negative under such treatment. A suspect, showing a negative reaction of the cerebro-spinal fluid in three successive examinations, several days intervening between each examination, may be regarded as free from general paralysis. In addition they remark that in general paralytics lumbar puncture is borne with impunity, accordingly there is no necessity to order the customary period of rest in the horizontal position by way of after-treatment. Therefore, tolerance of lumbar puncture may be added to the clinical signs of this disease.

Riese, Walther. CHANGES IN THE MEDULLA OBLONGATA OF A PARALYTIC. [Archiv f. Psychiat., Vol. 60, p. 1.]

The patient was brought to the psychiatric university clinic of Frankfurt in a condition of acute alcoholism. Wassermann was positive. The nervous examination indicated paralysis and this diagnosis was confirmed by the autopsy findings in the brain. The author describes more particularly the findings in the medulla oblongata which may be summed up as follows: (1) Destruction of medulla fibers in spots; (2) Gummatous neoplasms in the pia, endarteritic changes; (3) Apparently new vessel growths of the so-called intravascular type. In regard to the

first phenomena, the destruction of medullary fibers, the lesions were sharply defined and were discovered only in the dorsal segments. The author thinks they may be similar in nature to the cortical destructions of medullary substance described by Spielmeyer. The neoplasms were confined to the mesodermal elements. Beside the meningitic changes there was an infiltration of cells which suggested gummatose conditions. These infiltrations followed both the diffuse and the sharply defined type. The vessel changes were in the form of an endarteritis obliterans, and this phenomenon was observed at all levels of the medulla. The third pathological manifestation was in the form of a somewhat globe-like formation in the center of the lumen of a pial vessel, of medium caliber, suggesting a thrombus, though that this was the nature of the neoplasm could not be assumed with certainty on the evidence of a single preparation. The question arises whether there was any relationship between the lesions due to the destruction of medullary substance, on the one hand, and the tertiary luetic or endarteritic changes on the other and the author sees no reason why a causal connection between the two phenomena should not be assumed, but it is also possible that in progressive paralysis lesions in the medulla might arise from other causes.

Friedlaender, E. SYPHILOGENIC MENTAL DISEASES. [Ztschr. f. d. ges. Neurol. u. Psychiat., 1918, Vol. 43, p. 369.]

The author arrives at the following conclusions: in all cases of paralysis that are not entirely hopeless an energetic treatment should be resorted to and good results may be anticipated therefrom. The intraspinal treatment does not seem to offer any advantages over the intravenous. The most promising therapy according to the author's experience was with gradually increased doses of the three most important antiluetic remedies, salvarsan, mercury, and iodine; this treatment must be continued at intervals as Alter advises. Reports of fifteen cases treated in this way are given. Of these seven or 47 per cent. had long remissions and seven or 47 per cent. remained stationary and only one case, or 6 per cent., proved entirely refractory. Not only the somatic or mental phenomena, but the serological as well were favorably influenced by the specific treatment. The boundary lines between paralysis and the other syphilitic mental diseases, never very clear, become still more indefinite when the results of the specific treatment are taken into consideration. Numerous disease forms differing greatly from each other in character may be regarded as belonging to syphilitic mental diseases, for they arise in connection with the syphilitic infection, the infection acting as an inciting cause or intensifying the symptoms. Fourteen cases of different forms of mental disease following syphilis which were subjected to specific treatment are reported. In thirteen instances the disease was rendered less severe, the course was

shortened or prompt recovery was effected. Only one case was refractory. Thirteen other cases, developed on a basis of constitutional diathesis, were unaffected by the specific treatment notwithstanding the presence of syphilis; in only one case of this sort did the disease show any deviation from the typical course because of the presence of the syphilitic infection.

Weichbrodt, R. CONCERNING THE THERAPY OF PARALYSIS. [Archiv f. Psychiat., 1919, Vol. 61, p. 132.]

The few good results from attempted cures in paralysis might seem to indicate that the disease is incurable, but experience demonstrates that improvement sometimes takes place without any therapeutic intervention whatever, so that, theoretically, at least, it may be assumed that such improvements could be indefinitely prolonged, and Spielmeyer in 1912 expressed the opinion that complete recovery is not absolutely impossible. The author reviews the various experiments in therapeutic treatment of paralysis (224 works) and adds experiences in the Frankfurt university clinic which he personally observed. Salvarsan preparations were administered in doses of various quantities; no ill results due to the treatment were observed, but it is an open question whether the remissions which occurred were the result of the salvarsan or whether they would have taken place without treatment. The author refers also to experiments with the intravenous and intraspinal injection of salvarsan according to Swift-Ellis technique or modifications of it. Opinions differ in regard to the good results of the Swift-Ellis treatment. Gennerich, Nonne, Kafka, Kleist and others suggest modification from which they claim to have secured better results. From this comprehensive oversight the author comes to the conclusion that all chemical remedies, inclusive of the spirilloclides, have proved futile in the treatment of paralysis. For this reason he turns attention to another treatment about which there is still much controversy, namely the fever therapy. Cases are cited where there was anamnesis of febrile diseases after the infection and where, notwithstanding this, paralysis developed. However, in one group of 157 individuals who shortly after syphilitic infection had malaria, pneumonia, erysipelas, etc., there was not a single case of paralysis though lues cerebrospinalis developed in five cases. Again in 241luetics in whom the anamnesis showed a febrile disease there was no paralysis and eight cases of lues cerebrospinalis. The author is of the opinion that while the fever therapy does not always produce beneficial results, an intercurrent febrile disease, either acute or having a suppurative or phlegmonous inflammatory character affecting the skin and underlying tissue, has a favorable influence on an already existing lues. The author's experiments showed that in a rabbit inoculated with syphilis a temperature between 42 and 43 degrees destroyed the spirochetes so that after a few days no more could be

discovered. Experiments with hot baths were also made, but only in exceptional cases could a temperature be produced which was sufficient to have any influence on the spirochetes.

III. SYMBOLIC NEUROLOGY

1. NEUROSES—PSYCHONEUROSES.

Sanz, E. Fernández. ACCIDENTAL AND CONSTITUTIONAL PSYCHONEUROSES. [Med. Ibera, Nov. 8, 1919, J. A. M. A.]

Fernández expatiates on the difference in the outlook between what he calls constitutional and accidental psychoneuroses. The constitutional is continuous, with waves of aggravation and remission, while other psychoneuroses are intermittent, with relapses, separated by periods of latency. The constitutional group includes hysteric and psychasthenic psychoneuroses; the accidental group includes the cases of neuropsychic asthenia, anguish and simple depression. The prognosis is better with this latter group. He warns in speaking to patients to avoid the term "constitutional" in this connection as liable to depress them.

Kollarits, Jenö. METHODS OF EXAMINATION OF, AND THE FOUNDATION FOR PSEUDOANESTHESIA. [Zeitschr. f. d. ges. Neur. u. Psych., July 11, 1919, Vol. 49, p. 87.]

The author believes that these pseudoanesthesias are in most cases of artificial iatrogenic origin, that is, they are suggested unconsciously by the physician in the examination and that it is less important to invent methods to discover them than to find ways to avoid them. The physician may make sure of not giving rise to these symptoms either by not looking for them at all, or by looking for them in such a manner as not to favor their production in the hysterical patient. That the hysterical pseudoanesthesias have no reality is proved by the fact that the patients use the extremities in a perfectly normal manner. Not being real, of what nature are they? A suggestion which overwhelms the patient and which he accepts implicitly as a fact, or a simulation? The writer believes that the patients suspect what is desired of them and they pretend that the condition exists. It is only a stage play on their part, a form of simulation, and mythomania is at the root of the process. The author does not assert that all hysterical symptoms must be of the same mythomantic origin as are the pseudoanesthesias, but he places stress on the fact that this manner of regarding pseudoanesthesias and similar disturbances as of mythomantic character is at variance with the "suggestion" theory of hysteria. Suggestion implies a communication which is believed. There is absolutely no proof in these hysterical symptoms that the patients believe in the affection from which they claim to be suffering;—there is proof to the contrary, and the author

assenting to Wohlwill's view that the anesthasias are not passive but active, not a too little, but a too much, not an exclusion of the sense stimuli from consciousness, but an active repression of the sensations felt in consciousness, would make one correction, namely that the sensations are not repressed at all but simply denied.

Chavigny. THE MENTAL STOMACH. [Paris Méd., Dec. 27, 1919, J. A. M. A.]

Chavigny declares that we digest with our brains as well as with our stomachs. Gastric digestion is cerebral in large part, and cases of uncontrollable vomiting should be classed as mental dyspepsia, and be treated by psychiatrists after gastro-intestinal specialists have diagnosed the case. He remarks that psychiatrists will realize their finest successes in the *rééducation psychique de ces petits mentaux*. Most of the patients who seek the stomach specialists cherish special fads in regard to eating whole wheat bread or other special diet, or going barefoot, or they have other odd hobbies. It is remarkable, he exclaims, how persons in this category often do well on a diet that a normal person might have difficulty in digesting. He adds that the surgeon must beware of the operative adventures to which this class of patients often seek to entice him. The recent tragic death of Pozzi and of Guinard should warn to refuse to these *petits aliénés* with *troubles cénesthésiques* the operations for which they sometimes clamor. Soldiers with this "mental dyspepsia" should be given rapid mental retraining, with gymnastic exercises and military discipline. In one of the typical cases related, the relapse under emotional stress or extra responsibility confirmed the psychic element involved. The lack of any modification after a useless appendectomy, and the practically normal gastric chemistry testified that the uncontrollable vomiting in the previously healthy officer of 33 was of this nervous dyspepsia type, but more psychic than anatomically nervous.

Williams, T. A. THE EMOTIONS AND THEIR MECHANISM IN WARFARE. [Journal of Abnormal Psychology, April-July, 1919.]

The allegation has been made that the emotional strain of the war is the direct cause of functional disturbances of long duration among the soldiers. Statistics gathered at the French army centers do not bear out this statement. They show that a relatively small number of men apart from those having organic disease or toxic condition show nervous perturbation. The number of emotional cases are very small in comparison with the definitely hysterical and rapidly curable cases. Moreover patients of the emotional type are able to remain at the front without greater inconvenience than they would experience in civil life, provided they are not given responsibilities beyond their ability to bear.

One must remember that in severe states of fear, physical signs such

as pallor, changes in pulse, sweating, pilomotor reactions and pollakiuria are always present. Tremor can so easily be assumed that it is not an aid to diagnosis, nor is tachycardia because it is so often the result of other states such as cardiac exhaustion, intoxication, or disorders of the thyroid gland. True anxiety states which the patient is able to control during his waking hours are often manifested during sleep in terrifying dreams, in which the patient's dread overcomes him while his volition is partly in abeyance. Such dreams gradually lessen his resistance. These cases are very different from the alleged emotive type, which is really the hysterical type, and when genuine must be absolutely differentiated from asthenic conditions. The real mechanism in such cases is an associational fear psychosis.

In practice it is most important to make this distinction because such cases are readily curable, but only by the proper psychotherapeutic methods, whereas it is quite useless to attempt to cure asthenic symptoms by psychic means. Moreover the latter class of patient is unfit for military service on account of their physical weakness. The men under consideration are those who break down suddenly because of some alleged emotional shock or long-sustained strain. Among these there are two types, (1) those who are suffering from fatigue and hence have lowered powers of inhibition, and (2) the psychogenetic cases. The real mechanism of this type is the conditioning of the mental attitude by the conviction that the patient has that he is no longer able to withstand, what he believes to be the exceptional psychic strain at the front. This vicious mental attitude has to be changed in order to help such patients, and they can be cured in a comparatively short time by a proper understanding of the patient, and a reconditioning of his reactions to the situations which formerly were provocative of fear. Showing him the mechanism of the origin of his particular phobia is an important factor in enabling him to understand the real nature of his condition. Only when the patient possesses this understanding can he view his reactions rationally and almost impersonally, and because he has learned how these reactions occurred is able to forestall them. The fear-provoking situation must not be treated with a cowardly avoidance, but faced open-mindedly—the patient always analyzing his relation to the situation each time it arises and by viewing it in a scientific light, stripping it of its emotional aspect and nullifying its morbid effect.

The old methods of treating phobia were very different, and not only failed in many cases, but were often definitely harmful. Ridicule helped not at all, the rest cure gave the patient time to brood over his trouble, occupation and recreation often multiplied the occasions capable of provoking the phobia, and hypnotism increased suggestibility. None of these methods aimed at the cause of the trouble as all medical art should attempt to do. In such phobias the essential cause is a conditioning of the affective reactions towards a given situation, because of a misconception regarding it.

It must never be forgotten that the condition of emotionalism is easily simulated, as has been shown by the confessions of repatriated prisoners who used this means to convince their captors of permanent disability for further service. Under other circumstances, such confessions would be impossible to obtain, as they redound to the patient's discredit.

It is a very delicate task to persuade this class of patient that though they originally had justification for their manifestations, the physical states which caused them have long since ceased, and their present manifestations are illegitimate, and to enlist their aid in the restoration of their own health. The policy of the army towards functional nervous diseases, and of the country towards causes of cerebral commotion, and the pernicious effect of popular articles on shell shock combine to interfere with the soldier's recovery, and even encourage him in efforts to remain ill. Most people become inured to accustomed dangers because they feel they are not apt to happen to them. This same wise direction of the imagination very soon lessens the soldier's first fears. Few men feel that an impending battle is to be their last. In cases of desperate enterprise where the men face the chance of almost certain death other motives such as a high sense of duty, fear of seeming afraid, desire for glory, or belief in luck remove fear. Collective suggestion which depends largely upon the officers is a most important factor in keeping up the courage of troops. When a man does not respond to this influence, the neurologist tries to explain to him that he really has no legitimate excuse for not going into battle, and is mistaken in the motivation of his illness. If he is rational this suffices. Some men are reached more easily by persuasion, and some can be touched only by the certainty of disagreeable effects. There is more than a suspicion of dishonesty in some of these latter patients, but it is wiser for the physician not to expose the patient's guilty motives, because they must be able to hold up their heads among their companions.

If the patient can be convinced that his fears are groundless his qualms can quickly be overcome. Even when his fear is well founded his reactions towards the fear-provoking situation may be changed by imbuing him with a different attitude towards it. This substitution of a different set of ideas is a common procedure—in fact it is the means by which most men enable themselves to face willingly the probability of serious injury or death in war. In cases where that powerful aid, *esprit de corps*, fails to uphold a man, and he becomes dominated by fear, the psychotherapist must recondition his reactions to difficult situations. Most patients of this type exaggerate their emotional reactions in order to justify apparent cowardice which they themselves honestly reprehend. It must always be remembered that an emotional reaction to sudden and unexpected fright is natural, though it varies in different individuals. It is only its persistence which is abnormal. This persistence is due not to the quality or gravity of the emotion, but

to the fact that the emotional state is fostered by the patient, who allows himself to believe that he can no longer control every childish reaction, and continues to play an assumed part. [Author's abstract.]

Baeker, Hans. CONCERNING THERAPEUTIC RESULTS IN FUNCTIONAL DISTURBANCES IN SOLDIERS. [Neurologisches Centralblatt, January 16, 1918, No. 2, Vol. 37.]

The results described were obtained from experiences with three hundred and forty patients, of which 97.6 per cent. were essentially benefited. The author was convinced by observations in Nonne's institution at Hamburg of the good results of active treatment by hypnotism and by Kaufmann's strong current method. He met with great resistance on the part of the patients to these modes of treatment, however, and finally had recourse to the Rothmann method, in which the patient is placed under the influence of ether or chloric ether. He obtained excellent results in several cases, and thus the objections in nearly all others were overcome. Hypnosis was sometimes used as an auxiliary but the Kaufmann electric treatment was found to be unnecessary. The Rothmann injections were given in the operating room by the hospital surgeon and the patients remained in separate rooms until the following morning. Chloric ether or ether was chosen according to the general constitution of the patient, and to the curability, the nature, and the severity of the disturbance. Chloric ether, which is preferable because of the less disagreeable effects, was sufficient in monosymptomatic tremors, in slight dysbasia, pseudosciatica, slight paralysis, stuttering (ether is here directly contraindicated), where there is general weak constitution and bona voluntas. Ether is used in general tremors, severe dysbasia, flaccid and spastic paralysis, aphonia, mutism, visual disturbances, mala voluntas. Because of failure in the first application or because of relapse the narcosis treatment was repeated in some cases. On an average the disturbances had existed six and four tenths months before treatment, in two cases nineteen months and in one case twenty-six. No bad results from the strong current, the hypnotic, or the narcotic treatment were observed. Only about one fifth of those treated with ether complained of the unpleasantness of the intoxication; the other apparently retained no remembrance of it. The majority of the patients expressed joy immediately after recovery, some were even moved to tears by their gratitude, but these emotions were usually short-lived, and were replaced, it seemed, by a secret anxiety. Others, while still in a state of clouded consciousness of which later they retained no remembrance complained piteously, that as they were well they would have to return to the front. These circumstances show very well the ground for believing that at the foundation of the disease there is an intuitive inclination leading to the production and continuation of the symptoms, an automatic striving toward a condition of disability which,

it must always be emphasized, is wholly unconscious, and which, if it enters into consciousness, is repressed by moral impulses. This mechanism sometimes leads to a return of the symptoms, especially if the subject is sent back to military life; the only assurance against danger of relapse being the confidence of the patient that he is unfitted for further service. For this reason patients were usually sent directly from the hospital to their homes with permission to assume civilian dress.

Raether, M. TREATMENT OF FUNCTIONAL PSYCHIC DISTURBANCES BY THE SO-CALLED KAUFMANN METHOD. [*Neurologisches Centralblatt*, March 1, 1918, No. 5, Vol. 37.]

The author applied the Kaufmann method, in the Bonn clinic, for neurotics suffering from functional disturbances with the result that about 97 per cent. were cured, although many of the cases were stubborn ones of long standing, sent to this clinic for a repetition of treatment. In all he had more than four hundred recoveries, at least from the hysterical symptoms, though perhaps not from the hysterical constitution. Before the patients were released they were subjected to an after treatment and to tests including gymnastics, outdoor work and outdoor drill, under strict discipline, to determine if their hysterical habits, excitements, etc., had disappeared. Not only were cases of somatic functional disturbance treated, but also cases of psychic disturbance on hysterical foundation; these latter cases, supposed to be of psychic origin, naturally awakened the most interest. The author, convinced that if hysterogenic somatic disturbances could be cured by the Kaufmann method of applying a strong faradic stream, the hysterogenic psychic disturbances would at least be influenced by the same treatment, overcame the prejudice against the new method and applied it with astonishingly good results. Many specialists, for example Aschaffenburg, are opposed to this treatment even for neurotics without psychic disturbances, regarding it as a hardship, but Raether thinks this view is extreme, as the large number of those cured, reaching many thousands, is conclusive evidence of its efficacy. At least 75 per cent. were grateful for the application and recovery and among these were 15 per cent. of psychoneurotics. The most essential feature of this cure in psychic, as well as in somatic functional cases, is the suggestion that the mental disturbance of the patient is overcome by this modern treatment once for all, and that there is no danger of relapse. The author also believes that in certain cases the sudden faradic stream might be used for the purpose of differential diagnosis, especially where there is stupor or an inaccessible attitude. There need be no more prejudice against employing it for this purpose, in the author's opinion, than there is against making blood tests and spinal punctures for the same purpose. The author gives histories of a series of cases of widely different clinical characters, including psychogenic negativism, stupor of a pronounced

katatonic type, cases of depression, pseudodementia and even extreme cases of excitement. In conclusion the author says that although there is nothing new in the treatment of hysterical attacks, as somnambulism, weeping and crying fits, etc., by suggestion, he finds nothing in the literature concerning the treatment of psychogenic psychoses such as are here described, by these methods, and thus to a certain extent his active treatment by electricity is an innovation for a group of diseases which were formerly allowed to subside of themselves. He does not see in the Kaufmann method a cure-all for psychogenic disturbances of every sort, but he does consider it the most effective and most radical of all known therapeutic measures which employ the principle of suggestion, not only for old and stubborn somatic functional disturbances, but also for psychogenetic mental troubles.

Piltz, Johann. A CONTRIBUTION TO THE STUDY OF THE SO-CALLED WAR NEUROSES AND THEIR TREATMENT. [*Neurologisches Centralblatt*, October 1, 1918, No. 19, Vol. 37, continued in No. 20, page 682, No. 21, page 716, and No. 22, page 748, Vol. 37.]

Nervous cases for a large territory were sent to the university clinic at Krakau for treatment and for this reason a very large number fell under the writer's observation. These cases could be classified into four groups, as follows: Neurasthenia, hysteroneurasthenia, hysterohypochondria, and hysteria, the majority belonging to the last three groups. The hysterical symptoms generally manifested themselves in individuals with psychopathic constitution, and those suffering from hereditary weakness and psychopathic inferiority. In peace times, experience teaches, the psychopathic constitution reacts in a hysterical manner to various bodily or mental traumas, and, in war the exciting causes being multiplied, the result is the great number of cases of blindness, deafness, mutism, aphonia, tremors, pseudospastic paralysis, spasms, enuresis, depressed or excited states and states of clouded consciousness. All these conditions are not independent diseases but are merely expressions of a certain pathological tendency. By the patients themselves these symptoms are attributed to various causes, as fright, commotion, shell-shock, etc., but in the author's opinion these occurrences are only determining moments which set the real disease in action. However, we may often find in these determining circumstances the reason for the establishment of some particular symptom in preference to others in the variety of symptoms composing the so-called neurotic fear complex. The author sustains his view by calling attention to the fact that large groups of men in the field are seized with the neurotic symptom complex of fear during bombardments, etc., the symptoms, increased excitability of the sensory organs, acceleration of the heart action, disturbance of respiration, loss of speech, trembling, weakness or paralysis of the limbs, involuntary voiding of urine or bowel con-

tents, restlessness, weeping fits, disorientation, depression, etc., are manifested in individuals who are healthy as well as in those with psychopathic tendencies, but in the former they disappear in a few minutes or, at least, in a few days, while in the latter some of the symptoms become fixed. Anxiety and forebodings concerning the health arise and act as autosuggestions which are further fortified by psychic contagion when, in hospitals, these subjects are thrown with others who were wounded, or by irrational treatment, when their disabilities are wrongly considered to be the result of organic injuries or somatic diseases and are so treated. These facts show the necessity of a proper diagnosis from the start. Grave mistakes are often made; hysterical cases are mistaken for somatic diseases and vice versa. In one case that fell under the author's attention luetic hemiplegia was mistaken for malingering. Under irrational treatment of hysterical cases the author includes all sorts of mechanotherapy without proper suggestion, application of plaster casts in hysterical contractions, etc. These methods are harmful because they confirm the patient's belief in his disease; they are always useless and fail in cases where psychotherapy afterwards succeeds. Concerning aggravation of symptoms, the author is of the opinion that cases of this sort should be considered and treated as hysteria, because the tendency to intensify symptoms is an integral part of hysteria. Simulation, too, may be considered a hysterical characteristic in view of the fact that the science of neurology and psychiatry has no clear and definite sign for differentiating hysteria from malingering. Simulation also disappears under the same treatment as the symptoms universally recognized as hysterical. However, if simulation is included in hysteria the idea of the course of this disease will have to undergo a certain revision from a scientific standpoint. In dealing with neurotics the individual factor must always be taken into consideration; it is impossible to lay down hard and fast rules, for each patient must be treated in a manner in keeping with his education, his peculiarities of character, and the nature and severity of his disability. The most effective treatment for war neuroses is psychotherapy. This consists first in calming the patient and gaining his confidence, then in awakening his belief in his own power, in strengthening his will, and in correcting his pathological emotional tendencies and his morbid association of ideas, and finally in removing pathological auto-suggestion, or, in a word, in a sort of psychic orthopedia. In the treatment of hysteria, electricity after the methods of Kaufmann, in Germany, and Vincent, in France, plays a great part, but the author regards its therapeutic effect to be wholly due to suggestion. Instead of suggestion in the form of hypnotic seances in which the patient is put to sleep and the symptoms removed by suggestive influence in the form of commands, the author seeks to bring about what he calls a "dynamic effect" following Forel rather than Charcot. For example if he succeeds in diminishing a contraction by gymnastics, application of electricity or by any other method

he makes use of indirect suggestion, that is he congratulates the patient and encourages further efforts until the lost function is restored. Other physicians, however, for example Nonne, have attained brilliant results from suggestion in hypnotic sleep. The experience that hysterical patients recover more quickly when they are removed from their usual environment is due to the fact that they exercise more self-control in the presence of strangers than among acquaintances. In some cases the mere transfer to a neuropsychiatric section is sufficient to bring about a cure. Easily cured hysterical attacks of this sort are held by some physicians to be malingering, but this only goes to show that there is still much misunderstanding in the profession as to the true nature of hysteria. One factor which often prevents recovery is the resistance of patients themselves, because the disease for them is a flight from the realities of life, or a compromise therewith which promises them some benefit. Some even go so far as to declare that they do not wish to get well, that they would rather be shot. The writer from his experiences, concludes that most of the so-called war neuroses are amenable to treatment, that is the patient recovers from the symptoms, but the hysterical character remains unaltered. For the purpose of building up resistance against future attacks a certain educational therapy should be resorted to—ergotherapy, games, outdoor drill. The experiences in the war show that cases treated in hospitals and sanatoria not especially adapted for disease of this class, drag along for months without improvement and for this reason such cases should be sent to sections where the patients come under the direct attention of specialists in neurology and psychiatry; and further that, in view of the astonishingly good results in treating war neuroses, all previous prognostic and therapeutic views in regard to treatment of traumatic hysterical neuroses be revised, as well as the principles according to which indemnities were granted for them.

Henszelman, Aladár. SOME DATA CONCERNING THE ELECTRO-PSYCHIC TREATMENT OF WAR NEUROSES. [*Neurologisches Centralblatt*, September 16, 1919, No. 18, Vol. 38.]

The writer found at the Budapest clinic 96 per cent. of cases of war neuroses were cured by the electro-psychic treatment; including improvements the proportion reached 98 per cent. These cases were not selected ones, but just the general run of patients as they were presented. Only rarely were organic disturbances found coexisting with the functional. A remarkable fact is that nearly all cases belonged to the infantry. Wherever a trauma of any sort is really a mechanical factor in producing disease there are somatic changes giving rise to organic signs such as real shock of the central nervous system, bleeding in the brain and meninges, and disease due to pressure; such cases should not be treated by the electro-psychic method. Those who deny a psychogenic

derivation for war-neuroses are still striving to bring forth substantial support of their position, and the controversy is still open, because from the very nature of the problem, little experimental and post-mortem evidence can be adduced. As proof of the psychogenic character of these disturbances it is stated that M. Goldstein recently cured cases of this sort, of most widely different character, immediately behind the front, by means of hypnotism, and the author adds that never in any one of his own cases had he observed symptoms of organic nervous disease, *i.e.*, the Babinski phenomenon, abnormal tendon reflexes, or absence of deep reflexes, and that he agrees with the majority of other authorities that the disturbances are of psychogenic derivation. He does not assert that there is no such thing as malingering and aggravation of symptoms; in the horde of hysterics it would be strange if there were not some cases of this nature, but he holds that simulation itself is evidence of a psychic weakness, and, with Lewandowski, that it is very difficult to determine where hysteria ceases and malingering begins. Besides the business of the psychiatrist is not to expose crimes, but to heal the sick. From a scientific standpoint the physician could only differentiate hysteria from malingering by showing what symptoms really are pathognostic for the disease. This it is impossible to do because the symptoms are produced by suggestions contained in the circumstances of life and are therefore so varied and mingled that no constant disease picture could be formed from them. Hysteria imitates the symptoms of all diseases and the only signs common to the various cases of hysteria are the stigmata of degeneration, but these are found to a greater or less degree in every one. From a practical point of view it is unimportant how much the symptoms are aggravated; if there is conscious malingering the strong faradic current treatment may act as punishment without having the appearance of punishment. The results obtained by the Kaufmann method were astonishing. Rarely more than one application, lasting a few seconds, was necessary. It is the symptoms, however, that are cured and the hysterical character may betray itself by relapses, but notwithstanding this fact, the writer states, good results were attained. A serious epidemic was held in check, which there were no other means to combat; then too if the symptoms of limping and paralysis are overcome when they are first manifested the secondary changes, stiffening of muscles and muscle atrophy, are prevented. The curing of neurotics, even though only the symptoms are made to disappear, is, therefore, not merely idle child's play.

Singer, Kurt. THE END OF THE WAR AND THE NEUROSIS PROBLEM.
[Neurologisches Centralblatt, May 16, 1919, No. 16, Vol. 38.]

The study of soldiers suffering from war neurosis has, to a certain extent, come to an end. The prospect is now more interesting than the retrospect. The breaking out of the war gave rise to an emotional atti-

tude most favorable to the development of hysterical phenomena, and the commencement of the revolution to one most favorable for their cure. The strongest strain it was possible to place on soldiers ready for nervous breakdown, fear of life in the trenches, anxious anticipation of dangers, privations, and hardships, was removed. The good effect was enhanced because the removal of the threatened dangers was sudden, peracute. It was the best Kaufmann treatment, but without faradic current; it was the brilliant fulfillment of promises given without "suggestion." And the most interesting feature of all is that the revolution placed just that social class which furnishes the principal contingent of neurotics, namely, the laboring proletariat, in a position in which the neurotic complex as the expression of a protest against inferiority, repression, subordination was wholly dissolved. Where the reversal of social positions was so radical, flight from reality, in the form of disease, malingerings, and aggravation of symptoms was no longer necessary. Besides in the street assemblages and mobs there was ample opportunity to give vent to the emotional overflow which would have led to symptoms of irritability. The critical moment has, therefore, arrived for unmasking the true character of the neuroses and for recognizing it as a disease of protest or a defence reaction, and to establish justification for active therapy in dealing with disturbances of this nature. The soldier has reached the bridge on which, following his political ideal, he can attain health without the aid of the physician; the feeling of uncertainty and of inferiority, the foundation of the neurosis, is removed; the fiction of increased importance of the personality is set up with the resulting cure of the disease. The repressed psyche needed no other release, when the proclamation was issued that every common soldier and small laborer carried the marshal's staff in his knapsack. This enhancing of self-importance, the fiction of personal value, is not the soil upon which the neuroses unfold. And for this reason it was possible to close the neurotic section at Berlin. The behavior of the neurotic patients is described. Those who were cured left the hospital and did not return. Those who remained followed the directions of the physicians as far as possible. There was no need for disciplinary measures, though the discipline was not relaxed. The five last patients begged to be "cured" before their release, and their recovery was speedy. One pseudoneurotic who, eight days before, had fought vigorously against discharge, because he was suffering from such severe headache that he could not even go up and down stairs, took his place at the head of a soldiers' committee for the organization of hospitals and ran back and forth between Reichstag and hospital with a confidence and endurance that were truly astonishing. Such cases as these are additional proof of what the author had long suspected, that the resistances to recovery are in some cases more conscious than in others, from which may be inferred that for the one class any sort of sug-

gestive therapy will produce good results, while for the other, an active and rigorous one only will be effective. Until the close of the war every neurotic who suffered relapse could be ordered to the hospital, but under the new regime a legal commitment is necessary. The problem of their treatment is one of great industrial and legal importance in its bearing on indemnities for injuries and the lessons learned from the war should not be forgotten. In measure as neuroses are regarded as curable the number of cases will diminish, for the prospect of benefits in form of pensions, etc., will be reduced and in the author's opinion the widespread belief in the curability of neuroses will go far to eliminate simulation, for there will only be malingering where it pays.

Forster, E. CONCERNING THE PRIMARY AND SECONDARY EFFECTS OF PSYCHIC TRAUMAS IN LIEPMANN'S SENSE. [*Neurol. Centralbl.*, June 16, 1919, No. 12, Vol. 38.]

The author in a former article expressed the opinion that Liepmann's views concerning hysteria were wholly erroneous. He now wishes to retract this judgment, which was too hastily formed on an imperfect acquaintance with the original works of Liepmann, and to affirm his full agreement with what this writer says of the neuroses. The author's experiences in the field have been in accordance with this revised opinion. He finds that in neuroses there is a primary immediate effect produced by the psychic trauma, and a secondary mediate one—the one formerly called "ideagenic." When Liepmann says the emotion is a cause exactly like a stroke, or a virus, he refers to the first effect, not to the second, the essential factor of which is that it is a product of the psychic processes. The word psychogenic may be used for both conditions. To illustrate: In one sense the word means that the injurious occurrence from which a disease takes inception, is a process of consciousness (fright anxiety) which acts on the nervous system quite like any external poison or blow; in the other sense it means that the disease has been caused by the working over by consciousness of an injury. There is no doubt that extreme fright, great anxiety, etc., influence the smooth muscles, the excretions, secretions, etc. This process is a reflex one of the same nature as the conditional reflexes. This effect may be produced in various ways, when, for example a thin-walled vessel breaks from contraction in extreme fright, giving rise to meningeal bleeding. These reflex results of the emotion may produce injuries but they have nothing to do with the hysterical reaction. However, where there are neuropathic tendencies, less effort is made to overcome the reflex processes and in this sense the prolongation of the symptoms is due to the hysterical tendencies. If after the effects of the first injury have subsided, clinically similar conditions are suddenly manifested, these, according to the observations of the author, were always due to hysterical reaction as consequence of some idea of benefit to be derived, and they conform to the second type of Liepmann.

Haenel, Hans. HYSTERICAL PARAKINESIS. [Neurol. Centralbl., May 1, 1919, No. 9, Vol. 38.]

The cases of hysteria observed in men who participated in the war assumed a greater variety of forms than was before thought possible for this disease. But it soon became easy to distinguish some general types as fairly constant, one of which was a disturbance of motility of relatively frequent occurrence. The author describes this type: when the patient attempts to move the "paralyzed" member, all sorts of innervation impulses arise, varying greatly in strength, duration, and distribution which in their totality call forth a great amount of muscle work, fatiguing the patients so that at times perspiration breaks out and the pulse is accelerated, but without accomplishing the wished-for movement. In one series of cases there is a veritable chaos of innervations which influence various muscles in succession, jerking the limb he wished to move here and there in a purposeless manner. In another group the performance of the motion is hindered by the fact that simultaneously with the activating muscles, or even before them, the antagonists are drawn tense so that the motion is prevented or turned into an opposite one. A typical disturbance brought about by these conditions is the gait in pseudospastic paresis. The physician sees that the patients are exerting themselves to the utmost, they assert this fact also and often add, "Doctor, I do not know how I can do it differently." This phenomenon is due to errors in innervation; it is a shunting off of the energy into bypaths, a form of motor disorder which is observed in no other disease. Hysteria, the great imitatrix morborum, here presents a condition entirely unique of its kind, which should, for this reason, be given a definite name. The author suggests parakinesia amnestica, as the normal innervation is not destroyed by organic defect, but is merely forgotten. Not infrequently the motor amnesias arise from a sensory basis; the remembrance of the pain of a former wound or of bandages which for a time had hindered the free use of the limb is so lively and persisting in consciousness, that a free and natural innervation is impossible. In such cases the disturbance might be called parakinesia hypermnestica. Many cases of hysterical paralysis from shock or commotion are of this character. Weak fist closing is often due to the circumstance that, just as in true ataxia, the synergic contractions of the dorsal flexor of the hand are wanting, having been "forgotten." A demonstration is necessary to refresh the memory and remove the disturbance. On the other hand the erratic innervation may be of incredible obstinacy and may withstand the most active therapy. This phenomenon is often accompanied by sensory disturbances. Tremor may also be one of the symptoms, often arising from an over-innervation which is manifested in an apparently increased tonus of the trembling muscular apparatus. The patient makes wrong motions because, consciously or unconsciously, he seeks to hold the

trembling member by exercising more force. He no longer remembers that he can attain the desired steadiness by relaxing the muscles. If it is demonstrated to him that the relaxed muscle ceases to tremble, the memory picture may be reawakened and the disorder cured forthwith. It is for this reason that those affected with tremor respond better than any other class of neurotics to treatment with the strong faradic current; after the painful faradization there follows a relaxation of muscle from fatigue, and in this state the rhythmic play of activating nerves and antagonists which is responsible for the tremor ceases of itself and in the sensorium of the patient, for the mistaken defensive reaction—the parakinesis—the proper one is substituted. Stuttering is a disorder of similar mechanism and Gutzmann has applied the name parakinesis to it, but the author thinks that this word should be reserved as a genetic term for all motor disturbances of this nature.

Hauptmann, A. ISOLATED EDEMA WITH LESION OF A PERIPHERAL NERVE—A CONTRIBUTION TO THE ORGANIC FACTOR IN PSYCHOGENIC DISTURBANCES. [*Neurol. Centralbl.*, March 16, 1918, No. 6, Vol. 37.]

Where there is psychogenic paralysis of the extremities following some injury to them without any perceptible alteration of the gross anatomical structure of the motor or sensory nerve trunks, vasomotor disturbances in the form of edemas of the distal parts are frequently met with. Where there is complete paralysis of the extremities in question, these edemas may, with reason, be attributed to the stagnation of the lymph in the motionless and pendent members, and the fact that the edema disappears when passive movements are imparted to the limb or soon after the cure of the motor disturbances, could be used by those who hold to a psychogenic cause for these disturbances, as an argument in their favor. But those maintaining the opposite view point to the fact that in many cases edemas and other vasomotor and trophic changes persist for some time after the disappearance of the paralysis. Now how do these edemas arise, asks the author, and how are they cured? Is it possible that there are some sort of changes in the peripheral nerve trunks which do not manifest themselves in motor or electrical changes or in sensory defects, or are those right who defend the "reflex paralysis" theory, postulating an injury of the gray anterior cornu? The author gives a case of traumatic lesion of the nerve ulnaris with the development of an edema in the area of the ramifications of the nerve, without any motor or sensory disturbances. In his opinion this phenomenon could only have been produced by a lesion of the sympathetic part of the peripheral nerve, and he concludes that vasomotor disturbances conditioned by peripheral organic injuries have here taken place without concomitant signs in the motor and sensory nerves. Is it not possible that those edemas which remain after the disappearance of psychogenic motor disturbances may be due to a similar cause and that

it is not necessary to assume an injury of the spinal cord in the sense of a reflex paralysis, nor a secondary mechanical factor to account for them? It might seem more probable, in view of the author's experience, that the sympathetic part of the nerve could be affected by a peripheral lesion where motor and sensory disturbances were absent, the lesion being due not to a definitely localized injury in the neighborhood of the nerve trunk, but to a more general shattering of the nerves producing "dissociated" disturbances. Perhaps vasomotor effect in the otherwise psychogenic symptom complex after shell shock, etc., might be thus explained. The author thinks that observations such as he presents may throw some light upon the problem of the functional or organic nature of certain symptoms following severe contusion and it may thus become clear that in the conditions resulting therefrom there is a mingling of functional and organic factors. When the transient symptoms such as the edemas vanish in the course of suggestive treatment it should not immediately be assumed that they are psychogenic, for all symptoms that vanish during the period of psychic treatment need not, for that reason, be of psychic origin.

Dana, C. L. SOMATIC CAUSES OF PSYCHONEUROSES. [Journal A. M. A., April 24, 1920.]

The author maintains that the psychoneuroses are organic as well as psychic conditions. Being thus in part neurologic diseases, he thinks it would be a disaster if neurology were to abandon the study of this exceedingly numerous and sorely handicapped group of patients. If this should happen, they would go first perhaps to various types of psychotherapeutic specialists and perhaps later to clinical psychologists and pedagogues. The last is already happening. The management of these cases calls for the closest observation and the most accurate study of the personality, but also of physical, metabolic and endocrine defects. It is, therefore, to trained neurologists conscious of their responsibilities and familiar with the best technical methods that the care, and the prevention, of psychoneuroses belongs.

Friedlaender, R. THE SIGNIFICANCE OF RECIPROCAL PSYCHOSOMATIC INFLUENCES IN THE NEUROSIS PROBLEM. [Neurol. Centralbl., May 16, 1918, No. 10, Vol. 37.]

Though the knowledge of the neuroses has been greatly enriched by war experiences many phases of the problem are still obscure. The author thinks, however, that the significance of the psychic factor is now more generally recognized, thus opening the way to approach the neuroses from a psychological point of view. Those who followed Charcot and Moebius saw in the idea the explanation of these disturbances, but the feelings moods, and emotions are now considered also to play an important rôle in the development of the war neuroses. In

more recent works the "wish" which is often said to be "unconscious" is placed in the foreground to account for the fixation of the symptoms, while shock, fright, etc., are held to be the most important factors in setting the disease in action. Concerning the part played by the somatic trauma, there is wide diversity of opinion, however, Oppenheim considering it to be chiefly responsible for the disturbances; Gaup, Nonne, Lewandowski, Bonhoeffer believing this factor to have little to do with the etiology of the neuroses; Strümpell, Goldscheider, Binswanger and others holding that both somatic and psychic elements are responsible for the phenomena. In the author's opinion a better understanding of these disturbances may be attained by going out from the periphery instead of from the center. He follows the psychology of Ziehen and regards the sensation as the "immediately given." Sensation and ideas are usually accompanied by one of the opposite feelings, plain-pleasure (according to Ziehen) or excitement-rest, tension-relaxation (according to Wundt), that is to say, by a negative or positive emotional tone. In the pathogenesis of the neuroses it is the feelings with negative emphasis, or emotional tone, pain, excitement, tension, that are principally of significance. From these emotional tones which accompany both sensory impressions (sensory emotional tones) and ideas (ideative emotional tones), moods and affects develop which have the quality of extending to other sensations and ideas originally without such feeling stress. These moods and affects differ from the simple feelings of pleasure and pain by their greater intensity, their property of influencing the course of association to an extreme degree, and by certain accompanying physical effects, principally in the motor and vasomotor systems. It is the negative emotional tones, pain tensions, etc., that are the factors in the production of the psychoneuroses. It is not the ideas that give rise to these disorders but emotionally toned sensations from which arise ideas, moods and affects that color the entire mental life. Liepmann has called attention to the fact that it is the emotionally toned idea not the simple idea which is the cause of nervous symptoms. Summing up briefly, the primary centripetal or "corticopetal" components of the psychoneuroses are the sensations emphasized by negative emotional tones, pain, tension, etc., from which, on the ground of a special disposition and with the assistance of attention, ideas emphasized by the same negative feeling tones, as well as moods and emotions colored by them are developed. These, not the infinitely manifold and constantly changing content of the ideas, are the essential moment in the disease, though certain dominant, or guiding, or perseverant, ideas attain special prominence in the symptom complex. It seems, therefore, to the author that the "wish," the "will to disease," the "struggle for the pension," the "timor belli" are given too exclusive weight. Careful psychological analysis in individual cases would yield valuable material in deciding these questions. As for the unconscious, the half conscious,

and the subconscious—their existence, in the author's opinion, is very doubtful. Taking up what he considers the still more difficult problem of the centrifugal or "cortico-fugal" component of the psychoneuroses he seeks to explain how the psychic processes influence the somatic. In the neurotic subject this influence is manifested both in motivation and inhibition and may effect all the functions of the organization which are under nervous control, as motility, the vasomotor, the trophical, and the excretory processes. It is supposed to take place in the same manner as in health, for it is known that the emotions, especially fear and anxiety, have a certain paralyzing or exciting influence on the smooth and transversely striated muscles, as well as on the vasomotor and the cardiac apparatus, and on the activities of the glands. According to James and Lange the somatic factors are the essential and primary elements, and the emotions are nothing more than their after effects. In this "repercussion" theory the emotions arise secondarily, as result of the somatic changes accompanying sensation. The author states that though the majority of psychologists have rejected this theory one fact which it emphasizes cannot be denied even by its opponents, namely, that the sensations determine the degree of the emotion, so that a weak emotion can be strengthened and prolonged by renewal of the sensation. This is a fact of importance in accounting for the neuroses, because, going out from this point of view, they may be explained as a circular process; a "vicious circle" is assumed to be set up as result of reciprocal psychosomatic influences which first give rise to the pathological symptoms, then establish them and increase their intensity progressively. This circular process, which may be called a psychosomatic reciprocity, the author says, is not a hypothesis merely, but a fact of experience well known to every observer of functional nervous diseases. Starting with sensations in the widest sense, it is seen how these connect, in the individual suffering from chronic or acute psychoneurosis, with emotionally toned ideas, from which develop moods and affects which are emotionally toned in the same manner, leading in their turn to nervous phenomena of irritability or inhibition that constitute the clinical picture of the disease. This viewpoint seems to throw light on various obscure phases of the neuroses, for example it explains how the neuroses might arise in organic disease (rheumatism, neuritis, etc.); it also explains hypochondria as the fixation of ideas with painful emphasis in response to sensation; it explains autosuggestion, in the sense that the sensations with emphasized emotional tones influence the psyche and are returned in fortified somatic effects. Psychopathic neuroses in Babinski's sense and somatogenic neuroses in Strümpell's sense could be explained as infracortical, and an analogous reciprocal effect might be assumed between periphery and spinal centers. Goldscheider's experiments with clamps and his observation of the post traumatic neuroses have been in confirmation of the author's view. In the therapy

the effort should be to replace the negative (painful) ideas by others with positive (pleasant, restful) emphasis; the author thinks that the electro therapy has more than a suggestive effect, that it actually influences the nervous irritability and simulates to action and inhibition in proportion to the dosage. As a rational "corticopetal" therapy rest in a dark room is recommended because the nervous stimuli are thus limited.

Wohlwill, Friederich. CONCERNING A PHENOMENON IN THE EXAMINATION OF HYSTERICAL ANESTHESIAS (DISTURBANCE PHENOMENON). [Neurol. Centralbl., Dec. 16, 1918, No. 24, Vol. 37.]

Although the nature and origin of hysterical sensory disturbances are still far from being understood, all writers are unanimous in the opinion that there is little reality in these anesthetics, etc., in comparison not only with organic anesthetics, but also with the motor symptoms of hysteria. While hysterical paralysis acts just like organic paralysis, to the extent even that results independent of the will, such as edema, cyanosis, and atrophy, are present, the hysterical anesthetics act in a very different manner from those produced by organic causes, and the patient is able, if not prevented by accompanying motor disturbances, to carry out very delicate performances requiring fine sensory discrimination—for example of touch in an anesthetic hand, and, besides, where, for instance the sense of touch and thermal sense seem wholly absent, the patient never burns or injures himself as do those who are suffering from organically produced analgesias. The author describes a manner of examining patients to differentiate hysterical disturbances from organic. He tells the patient to close his eyes, then he touches various spots of the patient's body, announcing the fact each time by saying "now," and instructs the patient to respond with "yes" each time the touch is felt and "no" each time it is not. He touches the sound places and the anesthetic ones in rapid succession and in varying order. Confusion of responses or hesitations betray that the sensations from the areas claimed to be anesthetic reach consciousness. Where there is difficulty in determining whether motor or other disturbances accompanied by these anesthetics are hysterical or not, a test of this sort may be resorted to with the anesthetics and the result may give the clue to the nature of the other symptoms.

v. Artwinski, Eugen. CONCERNING HYSTERICAL DEAF MUTISM AND MUTISM, OBSERVED DURING THE WAR. [Neurol. Centralbl., July 16, 1919, No. 14, Vol. 38.]

The author had opportunity during the war, to study numerous cases of mutism and deaf mutism. They would fall under the category of hysteria as defined by Babinski, who says, "A phenomenon is hysterical when it can be exactly reproduced by suggestion and removed by per-

suasion." In most of the cases fright was the factor giving rise to the onset of the disturbances, which is in conformity with Oppenheim's view: but in one case the patient became deaf after sleeping between two deaf persons in the sick-ward so that this case could scarcely be said to have been the result of fright. Oppenheim thinks that deafness is a phenomenon which rapidly disappears, but in the author's experience the symptom lasted weeks or even months. To questions the patients reacted in various ways. Some did not answer at all; some pointed with lively gesticulations to the head, tongue, and ear, to show that they could not hear and speak. Oppenheim's method of making charts recording electric reactions to loud sounds showed curves differing in no essential way from those of normal persons but differing greatly from those who were organically deaf. These deaf and mute persons seized every opportunity to communicate in writing, confirming the view of Charcot, that writing in these cases is a compensatory reaction for the loss of speech. Many of the patients had manifested hysterical disturbances before the war, others showed neuropathic tendencies, and some were without any stigmata. In about 60 per cent. of the cases slight traces of some former organic disease in ear or throat were discernible, and these former diseases, in the author's opinion, determined the establishment of deafness and mutism in preference to any other of the various hysterical symptoms. In the majority of cases the institution regime was sufficient to bring about cure; in one case the recovery took place suddenly while the patient was in a waking state. In other cases an energetic psychotherapy in the form of faradization of the ear region was necessary. All cures were accompanied by the usual euphoria observed in hysterical cases that recover.

Sanz, E. F. HYSTERIA MAJOR. [Siglo Méd., 18, 1919, J. A. M. A.]

Fernández reports two extreme cases of hysteria in young women. One had been having for seven years congestion in various regions, including the eyelids and throat, fleeting edema, hemorrhages, especially from the stomach, attacks of retention of urine for several days, compelling the use of the catheter, and occasional periods of delirium, with long conversations with imaginary persons. In the other woman the hysteria caused convulsions, the clonic and tonic contractions keeping up for several hours several times a day, with a lethargic condition during the intervals. There was nothing in the patient or the family history to suggest any predisposing factors in this case, except zones of hyperalgesia in the scalp, lids and precordium. The symptoms had developed first after an attack of influenza during which venesection was done twice. The convulsions followed at once after the venesection, and have persisted very frequent and distressing to date.

Kempner, Alfons. A CASE OF PUPILLARY DISTURBANCE IN A HYSTERICAL ATTACK. [*Neurol. Centralbl.*, April 1, 1919, No. 7, Vol. 38.]

The author had opportunity in the section for mental and nervous diseases of the reserve hospital, Ingolstadt, to observe in a soldier suffering from hysteria pupillary disturbances in the form of dilatation, inequality, and rigidity to light. Noting that the occurrence of rigidity of pupils in hysterical attacks seems to be proved, he states that data as to the frequency of such disturbances and knowledge of their character is wanting. In the author's case there could be no doubt as to the diagnosis of hysteria and from the anamnesis it could be regarded as of traumatic origin. The trembling and general analgesia would have been sufficient to justify the diagnosis even if the character of the spasms were not taken into consideration. These attacks differed in essential respects from those of epilepsy; the apparent unconsciousness was not complete—a fact shown by certain reactions when water was thrown on the patient, etc.; the spasms were not communicated from one part of the body to another in the same manner as in epilepsy, and tonic and clonic spasms existed synchronously in different muscle groups, instead of occurring in succession, the tonic being followed by the clonic. The pupillary symptoms are the only ones which suggest epilepsy. The simple dilatation of the pupils might have been due to the excitement but the inequality can not be thus accounted for. Rigidity of the pupils to light at the point of extreme dilatation is characteristic of epilepsy while it is very rare in hysteria. That it sometimes occurs, however, has been proved beyond all objection. To verify his own opinion as to the diagnosis of hysteria the author sought that of Dr. Grundl, and in order to exclude all doubt as to the adequacy of the ocular experiments he was very careful as to the strength of the light and its distance from the eye. The author believes that inequality of pupils in hysterical cases has never before been described. The cause of the dilatation of the pupils he thinks may be, in part, an irritation of the sympatheticus, a view supported by the fact that in his spasms the patient drew his head back forcefully, so that the phenomenon would be similar to that described by Bumke, who mentions pupillary dilatation and rigidity as phenomena accompanying muscle action in the backward movement of the head. The irritation of the sympatheticus alone would not be sufficient, however, to explain the inequality of the pupils, unless there was a permanent difference in the irritability of the two sympathetici, which was not the case, for, except in the spasms, there was no inequality of pupils. The author thinks it probable that both the inequality of the pupils and the dilatation depended not alone on the cervical sympathetici, but that in the hysterical spasms, as in epileptic attacks, the whole cortex is in a condition of general irritation. It could then be assumed that a difference of irritation on the two sides of the brain produced the differences in the pupils, though

it was not great enough to produce discernible differences in the bodily reaction on the two sides; explicable on the ground that a much more delicate difference in the irritation would become apparent in the pupils than in the voluntary muscles. It seems to the author also impossible to explain the rigidity of the pupils to light as due to an irritation of the sympatheticus alone. He thinks that besides the stimulus to the dilatator pupillae, there must be a paralysis of the sphincter or some inhibitive factor due to the irritated condition of the brain.

2. PSYCHOSES.

Ireland, Merritte W. CARE OF ARMY'S MENTAL DEFECTIVES.

Major-General Ireland, in a statement made to the Senate Committee on Military Affairs on December 13, assured the committee that the office of the Surgeon-General was extending every possible attention to the many mental and nervous patients in the Army, says the Army and Navy Journal for December 21, 1918. At the psychic hospital at Plattsburg Barracks, N. Y., the Surgeon-General has on his staff the most eminent nerve and brain specialists in the United States. Some of the cures reported are remarkable, for many of the men are discharged cured in twenty-four hours. The number of mental and nervous cases requiring special treatment among soldiers in camps in this country is 2.5 per 1,000, slightly above the number of cases in civil life. Among troops overseas the number is 10 per 1,000. Six hospitals abroad are used exclusively for treating these cases. At each base hospital facilities are provided for emergency treatment of the mentally defective. General Ireland told the committee that the news of the armistice had a singular effect upon the 2,500 shell shock patients awaiting transportation to the United States. Within a day or two following the armistice it was found that 2,100 of this number had been restored to normal. Senator Johnson, of California, brought out the fact that fear does not cause shell shock, and that among the sufferers were found many men who had been decorated for extraordinary bravery in battle. Neurologists, it was stated, observed every shell shock or defective case once in twenty-four hours. The Army's careful test for mental weakness when men were inducted into the service showed a remarkable record, only 400 cases developing in the first 800,000 men examined.

Byrne, Joseph. OPERATIVE TREATMENT OF EPILEPSY. [N. Y. Acad. Med., Ap. 5, 1918. N. Y. Med. J., Feb. 22, 1919.]

CASE I.—Byrne presented four cases operated upon by Dr. A. S. Taylor. A girl 14 years of age, had been run over at the age of three years and was unconscious for quite a long time. At the age of eight years she began to have attacks of petit mal, numbering ten or twelve a day. She finally developed attacks of grand mal when the attacks of

petit mal ceased, she had four or five grand mal attacks a day and later these became less frequent, being only two or three a week. She went along in this way until about a year and a half ago when she came under our observation. The usual examination of the spinal fluid and eye grounds, as well as X-ray of the head, etc., were made. It was decided on the basis of the signal symptoms that it would be best to operate on the left side of the skull. Since operation the girl was much better. Most of the cases reported on for epilepsy had a few grand mal attacks within the first few days after operation and then there might not be any attacks for a long period. This was what happened in this case. About six weeks after the operation the girl's father treated her rather harshly and she immediately had grand mal attacks. She was given bromides and suggestive therapy. She had thirteen attacks since operation one year ago but had improved most wonderfully in general health and mentality. The bromides were discontinued for long periods without recurrence of the attacks, but recently she had had another attack and she was now getting a small amount of bromides, in addition to treatment along the lines of mental therapy as suggested by the psycho-analytic viewpoint. She was now attending school, and making satisfactory progress.

CASE II.—A man 55 years of age, who had had many injuries of the skull. As a boy he had been kicked in the head by a horse and had had several accidents. About ten years ago he began to have epileptic seizures. One and a half years ago he had a stroke of apoplexy causing right hemiplegia. He recovered fairly well from this and had been in fairly good condition, still having, however, epileptiform seizures (grand mal) every four to six weeks. He was operated on and was greatly improved. Since the operation, left sub-temporal decompression one year ago, he had had no attacks with the exception of one four days ago. No bromide treatment was given since the operation.

CASE III.—This was a traveling salesman with a history of trauma. His attacks of grand mal began as sensory disturbances in the right hand, that was, a feeling of pins and needles or of an electric shock. It was worthy of note that pain was not a feature of cortical irritation. In all cases in which pain was complained of we should find out whether the patient meant the same thing when he spoke of pain as the physician meant. In many cases in which patients complained of so-called pain in the head it was found on analysis that he had no pain in the real sense of the word, but an abnormal feeling which caused alarm, which he called pain for the want of a more definite term. Irritation of the sensory cortex did not cause pain in the real sense, but a feeling of itching without disagreeable effect. Soon after the operation he had several grand mal attacks, but none since leaving the hospital. His attacks formerly came at intervals of one year or ten months apart, so in his case it was probably too soon to state definitely just what benefit

he had received from the operation. His general condition was however markedly improved. .

CASE IV.—This patient, a man 45 years of age, had a fall between his fourth and fifth year. He lost the faculty of speech and had some paralysis. The left eye now showed optic atrophy, which not rarely followed apparently trivial injuries of the orbit. The patient had formerly been able to attend to his business, but of late years he had been unable to hold a position. It seemed possible that in this case mental therapy had been a help as well as the operation. It sometimes seemed that the mere performance of an operation put the patient in such a state of expectancy that mental therapy could be used most effectively. Since operation this man had no attacks as long as he behaved himself, but if he imbibed too freely or ate intemperately an attack might supervene. Since the operation the patient's condition was so much improved that he got married.

Bertelsen, E., and Wimmer, A. SENILE DEMENTIA AND LOCALIZED SYMPTOMS. [Hospitalstidende, April 2, 1919.]

The clinical and necropsy findings are here reported in three patients with senile dementia, with word deafness, echolalia and defects in reading, writing, and paraphasia. A fourth patient had hemianopsia without disturbances in speech and atrophy. Arterio-capillary fibrosis was marked in the others.

Hodges, J. A. NERVOUS AND PSYCHIC EFFECTS OF INFLUENZA. [Virginia Medical Monthly, July, 1919.]

The author states that the recent epidemic of influenza, in his section of the country, was notable for its effects on the nervous system. These nervous effects were mainly functional and symptomatic in type, but the psychic were uniformly graver and more rebellious. Of twenty-eight cases showing symptoms of genuine psychoses, eleven were classed as toxi-infectious delirium, eight as dementia præcox, three as encephalitis, and four as other psychoses, while two could not be rationally grouped. The average interval between the termination of the acute influenzal attack and the incidence of a psychosis was twelve days. Neither the duration nor the severity of the influenza materially influenced the psychoses. Two or three of the toxi-infectious cases were becoming gradually more like a frank dementia præcox. The mental disturbances met with did not differ materially from the same conditions arising from other causes, except that depression was less frequent as a symptom. Two of the cases grouped as encephalitis were instances of encephalitis lethargica, and the other, acute hemorrhagic encephalitis. In the two former cases the patients died and in the latter they recovered. Continued elimination and tonic treatment proved of value in a fair proportion of cases.

Porot, A., and Hesnard, A. INFLUENZAL PSYCHOSES. [Paris Med., 9, 1919, No. 34. J. A. M. A.]

Porot and Hesnard insist that the delirium and psychoses accompanying or following influenza are the most typical example and synthetic illustration of this form of acute infectious mental pathology which requires general care rather than special institutional care, the clinician rather than the alienist. There is no essential difference between the brief delirium and the psychoses which may drag along for weeks or months on account of some predisposition or reënforcement from secondary factors. The delirium with influenza may not accompany the fever but develop later when the lack of nourishing food, the secondary autointoxication and the exhaustion from the disease combine to sap the vitality, especially after alcoholic or other excess and intoxication. The initial disorder is connected with an organic condition, and this latter is what determines the indications for therapeutics.

v. Monakow, C., and Kitabayashi, S. CHOROID PLEXUS CHANGES IN SCHIZOPHRENIA. [Schweiz. Arch. f. Neur. u. Psych., Vol. 4, No. 2.]

This is an attempt to find a morphological basis for dementia præcox founded on the observations of frequently found choroid plexus lesions in the psychotic. Twelve brains of schizophrenics are here analyzed from the standpoint of these changes. The authors drag in an endocrine hypothesis and present some speculations concerning the amyloid degeneration found, the necroses, interpapillary exudates and colloid mass accumulations. The changes of senility are quite different, they claim.

Ferranini. THE NERVOUS SYSTEM IN THE TUBERCULOUS. [Riforma Medica, February 22, 1919.]

This observer here calls attention to the extreme and intense excitability of the nervous system in tuberculous patients. He reports various laboratory measurements which reveal the rapidity and early exhaustion of nervous reaction with the weakened tonic capacity which accompanies it. He attributes this to the action of the toxins upon the nerves, which, with the action upon the endocrine system or the effect of the latter action again upon the nervous excitability, forms a vicious circle. To this must also be added toxic irregularities of growth which affect principally the nervous system, which may be of importance in the growth of the young. Such manifestation of this nervous excitability may be of diagnostic import in the case of older individuals. From this viewpoint there is seen to be a possible close association of tuberculosis with the nervous system in its anatomical growth. For the author also describes the injury that may result to the spinal cord and its roots by an exaggerated growth of the brain, through the physiological

disturbance which results, or through the toxic action upon the nerves or through the endocrine system. And all this serves to open the way to a still further very important consideration to which the anatomical and physiological facts are a basis. If one considers these as the pathways of energy distribution and as such informed and governed by the putting forth of energy or the withholding of it from output which marks the personality, there appears another most important and non-negligible point of attack upon this nervous phase of tuberculosis. The extreme irritability is indeed a most important diagnostic sign. It may be also psychically a diagnostic and therapeutic factor of which service should be made. The most advanced psychic therapy aims at the discovery of energy exhaustion in a badly regulated output or in a restraint of external output for hidden psychic reasons, which interferes with active utilization upon the external world and its interests. In such case the energy is driven to an activity within the physiological or autonomic personality, there to produce serious disturbance, which causes receptivity rather than resistance to infectious agents and their activity. Does not therefore the calling of attention to this significant nervous irritability strongly suggest the necessity of psychotherapeutic inquiry? The initial and warning appearance of such proof of badly used energy should contain significant possibilities, at least in incipient cases of tuberculosis. There should be a promising field here for prophylaxis against the development of such a psychic state and its consequent influence upon the physiological condition.

An instance like the following is all too typical of the complete lack of understanding on the part of the patient and of the medical measures which too often foster the destructive energy activity in its secret psychic and physiological strongholds. No means are used to discover it and direct it to a discharge which would relieve the overwrought nerves and other physiological pathways. A patient with a comparatively mild infection, but with a disposition which had timidly, but unconsciously to itself, shrunk from all forms of effort demanding responsibility, most conscientiously took the doctor's advice and undertook to combat the disease by the most rigid abstention from all interests at home or abroad which could demand the slightest effort, kept the letter of the law most scrupulously, but rapidly declined and died. The actual ravages of tuberculosis were insufficient to have caused her death but the entire nervous system had reached a hypersensitivity which had produced an uncontrollable nervousness and a general derangement of all the organs so that the anarchy within the body was such that life could no longer be maintained. All the efforts of the physicians, as well as of the patient, had been toward fostering energy, but all avenues for its safe discharge had been neglected or deliberately cut off. Should not the testimony from the anatomy and physiology of the nervous system drive medicine also to a consideration of the psychotherapeutic duty involved in such cases? [Ed. N. Y. Med. J.]

Amrein, O. TUBERCULOSIS AND THE PERSONALITY. [Correspbl. f. Sch. Aerzte., 49, 1919, No. 35. J. A. M. A.]

In this long study of the change in tastes and character under the influence of tuberculosis, Amrein warns among other things of letting the patients develop "thermometer-mania." One of his patients left the dinner table once to insist on having his temperature taken, and as the hot soup had warmed his mouth, the thermometer reading sent him to bed "very ill," expecting hemoptysis at once. Another patient routed out by a fire at night saved only his thermometer and fever chart. Amrein comments on the evils of excesses of all kinds in games, dancing, drinking, etc. A single dancing party or drinking bout may undo months of patient sanatorium treatment. One of his patients had a tuberculous cavity rupture during a lively dance, with fatal outcome. The long separation from home and occupation, the opportunities, he says, for *das Flirten* are reënforced, he thinks, by a direct stimulating influence from the tuberculosis toxins on the sexual appetite, especially at time of higher temperature. This applies particularly to patients with a long subfebrile temperature, 37.5° to 37.8° C., and they also seem peculiarly liable to irresponsibility in general. Many physicians have noticed how much more sensible their patients seem to act after recovery, their nervous system more stable. His plea is that the physician should pay more attention to the mind and character of the tuberculous, seeking to train and guide them. This of course can be accomplished best in a well managed sanatorium, and he reiterates that this is "terribly important" in treatment, especially of pulmonary tuberculosis. Some patients do even better without the strict discipline of a sanatorium. The physician has to individualize and treat them psychologically.

Glueck, B. THE FUNCTIONS OF A MENTAL CLINIC. [Neurological Bulletin, June, 1919.]

Glueck calls attention to the many differences between a psychiatric clinic and other medical clinics. On account of the fact that mental disorders are primarily the result of failure to adapt to environment, their victims are usually unable to continue their social and industrial lives as ambulant medical patients are often able to do. Should they attempt to do so, they may become serious annoyances, or even menaces to the community. Hence the important service which the mental clinic can render to society, especially if associated with efficient social service. Another important feature of the mental clinic, as distinguished from the medical clinic, is that it must treat that complex thing known as the personality and, moreover, often must deal with the patient's relatives. Thus the cause of the trouble in a five year old boy, a masturbator, nervous and pugnacious, was found in the mother's mishandling of the situation, and the latter's education benefited the boy immensely.

Glueck cites other illustrative cases. The atmosphere of the mental clinic must be tolerant. Sufficient time must be given the patients. Where several physicians handle such a clinic it might be well, if possible, to assign certain physicians to organic problems or to functional problems, according to their respective leanings. The social worker should be trained in mental hygiene and carry it into the homes of the patients.

Kline, Geo. M. FUNCTIONS OF THE SOCIAL WORKER IN RELATION TO A STATE PROGRAM. [Mental Hygiene, 1919, No. 4.]

Before analyzing the relationship of social work to a state program it may be interesting to note briefly the development of methods used since early days.

The right to deprive an insane person of his liberty existed in England under the common law which was transferred to the colonies in America. It was regarded as justifiable to "confine, bind and beat in such manner as might be required under existing circumstances." Care by relatives consisted mainly in confining in cells, pens and cages in most unhealthy conditions. The policy was that of economy. In colonial times there was no machinery to enable the state to carry out its obligations to the dependent classes.

In 1727 "disorderly persons" had become so numerous that a colony workhouse was built to which all disturbers of the public peace were committed regardless of their mental condition. So far as known between 1793 and 1824 there was no public place in which harmless, insane persons, not criminal, could be confined. According to Mosher the first statute in existence regarding the insane was passed in 1788, entitled "An Act Apprehending and Punishing Disorderly Persons." "Whereas, there are persons who, by lunacy or otherwise, are furiously mad and so disordered in their senses as to be dangerous to go abroad, it shall be lawful for two or more Justices of the Peace to cause to be apprehended and kept safely locked up, such persons in some secure place, and if necessary, be chained there," etc.

Prior to the nineteenth century care of the insane in America was largely a local matter and was entirely custodial. The purpose of confinement was for safe-keeping and was accomplished in ill-ventilated cells or pens in the basements of hospitals and other places. This was the only care that the medical profession and the public deemed necessary for insane persons. In many states, notably in New England, the contract for the pauper insane was awarded annually to the lowest bidder. In Connecticut, Massachusetts and New Hampshire, the insane poor, being classed as paupers were annually sold at auction to those who were willing to care for such persons for a money consideration.

The first pauper insane State Hospital was established in Worcester, Mass., 1832; the second was in New York in 1843. State care is the

care of the dependent insane exercised by the state as state charges, and is in no way under the management of county or town officials. State care is both custodial and educational. The policy of early days was economy in caring for dependents; that of today is based on humanitarian principles—then, it was safety for the public—now it is restoration of the patient. All the contributing factors, social and medical, which have played a part in the breaking down of the mental faculties should be intelligently considered. The causes of mental illness as given by the laity are largely of a social nature—poverty, worry, overwork, alcoholism, immorality, unfortunate love affairs, social maladjustments, etc. Although these factors may have long been known to the medical profession, there seems to have been no practical way of dealing with them until social service was introduced into the state hospital. At the present time, the main functions of social service are to contribute to psychiatric knowledge and to aid in matters of social adjustment.

The value of social service to any state hospital depends largely upon the quality of the case work. Social problems connected with the illness of patients are very significant. Knowledge of social factors plus medical findings will generally indicate a form of treatment and aid in matters of social adjustment. At the present time, the social worker largely confines herself to the study of environmental conditions, later the problems of personality as related to home life, community conditions and industry will doubtless receive much more attention.

Social history work is an important branch of social service and means that the best resources are used for obtaining knowledge relative to the welfare of the patient. Community work is equally important: to a large extent social organizations in the community supply the machinery for the readjustment of patients and the problem of the psychiatric social worker is to coördinate their special services for hospital use. An interesting part of the duties of the worker is to impart correct information in the community as to the purpose and methods of state hospital care. Fear of state hospitals is being gradually replaced by coöperation and confidence as the purposes and methods of state care are better understood. Recent studies have shown the possibilities of preventing many forms of mental illness—so-called border-line cases between the normal and defective groups—especially those types of diseases associated with fatigue, anxiety and social maladjustment. Suitable and early treatment might result in the prevention of more serious conditions. The out-patient clinic with a social service adjunct answers a double purpose in the after care of patients and its educational work in the community. . . . Social service from the viewpoints of legislation and education covers a broad field. The community should know more of mental disorders, their causes and prevention, and should be encouraged to assume much the same attitude which it now holds toward tuberculosis and syphilis. The combination

of physicians, social workers, clergymen and teachers along lines of mental hygiene will help tremendously in the field of mental health.

The movement to make social service an adjunct to psychiatric treatment is apparently gaining in favor. In Massachusetts, the Commission on Mental Diseases has recently adopted social service as part of its policy and it now holds a definite place on the state program. Of the fourteen state hospitals, ten are now engaged in some form of social work. A most encouraging feature of a recent survey of these institutions was noted in that the superintendents were practically unanimous in their desire for social work. . . . This section of the state's program indicates that social work, intra and extra mural, is to be established on a firm basis. A comprehensive plan for coördinating and developing various phases of the work includes uniform records and statistics, standardization of methods and correlation with the various community resources. Subdivisions of the work are: development of social case work, social investigation, history work, placing and care of boarding patients, after care or supervision work, special studies, out-patient clinic work, etc. A plan for training volunteers and students is under consideration.

The future development of psychiatric social work in state hospitals will depend largely upon the organization of the work and upon the qualifications, natural and acquired, of persons who enter the service. The social service department of a state hospital, although distinct in itself, should be so organized and developed that it will fit smoothly and harmoniously into other departments of hospital work. The spirit of social service should pervade the hospital atmosphere and serve as a constant reminder to those interested in the general care of the mentally sick that social welfare is of more value than economic and scientific methods—that human kindness is a more powerful agency than the exercise of temporary authority or the exhibition of power and in reality is the “all-pervading power of moral discipline.” [Author's abstract.]

Schroeder, Theodore. REVIVALS, SEX AND HOLY GHOST. [Journal of Abnormal Psychology, Vol. 14, 34-47.]

In the course of his psychogenetic studies of religious experience, Schroeder made careful observations at a negro revival. In this article there is a quite detailed description of the jumping, dancing, singing, etc., of those who came under the spell of the revivalist and some description of the revivalist's technique. An attempt is made to interpret these “mysteries” in terms of what is already known.

The most extraordinary results in the audience, were not the effect of the pastor's denunciation of sin and satan, but came as a consequence of the revivalist's complete abandonment to his own emotionalism. At times his subjectivism was so obsessive as apparently to

exclude all consciousness of the pastor's environment, while he abandoned himself to a most intense subjectivism. "I can adequately describe his apparent condition by reference to only one other human experience. It seemed to me very much like the uttermost of sexual orgasm." This abandonment to a complete subjectivism was contagious through suggestion, and induced the release of repressed erotism in the audience. The jumping, dancing, rolling, etc., is said to be due to the necessity for pelvic or other muscular movements of the orgasmic spasm.

The less violent religious experiences are assumed to be the same in essence and by comparison the variation is inferred to be due to relative normality of sex-like and to the lesser attendant emotional disturbances. With approximately normal sexuo-emotional conditions religious experience fades out. Because of the irresistible quality of this involuntary compulsion and the ignorance of facts or the unwillingness of the experiencing persons to face the facts, this compulsion is thought to transcend all that is human and is ascribed to something outside and above the organism, that is to the Holy Ghost or of God. Thus comes the inward miracle of grace, the mysterious operation of the Holy Spirit, etc., etc. From some points of view this is one of the best in the author's many contributions to the erotogenetic interpretations of religion. [Author's abstract.]

Macht, D. I., and Isaacs, S. OPIUM AND REACTION TIME. [Psychobiology, Vol. 1, No. 1, 1919. J. A. M. A.]

The experiments reported on by Macht and Isaacs were made on twelve normal subjects. They used morphin sulphate, narcotin hydrochlorid, narcophin and pantopon or pantopium. They found that the effect of morphine alone and the combination with other opium alkaloids depends on the dose used and may be manifested by a change in the mean reading, a change in the mean variation of the readings, or by both of these; and in case of association tests, by the number of errors made in performing a mathematical calculation. After small doses of morphine, there is generally a primary stage of stimulation or quickened reaction time; this may or may not be followed by a secondary stage of depression, as indicated by narcosis and prolongation of the reaction time. After larger doses of morphin, the primary stimulation stage is very short and may be overlooked, whereas the secondary stage or stage of depression is predominant. From the experiments made with combinations of morphin with other opium alkaloids in the form of narcophin and pantopon, it appears that morphin given in such a form is more narcotic and correspondingly more depressant to the psychic functions than when the same dose of morphin is administered to the same subject by itself.

Juarros, C. MORPHINE ADDICTION. [Siglo Med., Sept. 6, 1919. J. A. M. A.]

Juarros comments on the constantly increasing numbers of morphin addicts, and emphasizes that treatment must be individualized, using the abrupt or the gradual method of suppressing the drug according as the patient is young, with the habit acquired within three years, the doses not over 2 gm. at most, and the viscera sound, or as the habit is of long standing and large amounts of morphin have been regularly taken. In this latter group, abrupt suspension is dangerous, especially if the patient is over forty, and has organic disease of any kind, particularly of the cardiovascular system. Strict individualization is necessary, even for the purges ordered. The lack of this is responsible for the many addicts whose cases are considered beyond redemption because two or three courses of treatment have failed. Juarros reiterates that 99 per cent. can be cured without fail if the physician can refrain from imposing his favorite method of treatment on all alike, and will remember that psychotherapy is an indispensable adjuvant. He prefers Sollier's technic for rapid suspension and Jennings' for the slow method.

Book Reviews

Freud, Sigmund. A GENERAL INTRODUCTION TO PSYCHOANALYSIS. Authorized Translation. Preface by G. Stanley Hall. New York, Boni and Liveright. 1920.

For nearly three decades psychoanalysis has been the subject of conscientious experiment. The spread of its influence has been so inevitable that in spite of unexampled resistance to it practically every field of thought manifests at least an inquiring interest in regard to it. Its establishment as a branch of treatment of psychic disorders has become so assured that it cannot be disregarded. One may not choose to follow it but anyone in line with progress is obliged at least to examine its claims. The meaning of the principles on which it is based also cannot be excluded from the equipment of the present day psychologist as well as the neurologist and psychiatrist. Educators, parents, students of art and literature manifest in a constantly increasing degree their appreciation of its aid in understanding human activity and in guiding that to better ends.

This book therefore is one which the world generally has awaited. It is one which even the strongly resistant opponent must welcome in the exceptional opportunity it gives for examination of the subject. For here is a detailed exposition from the discoverer and developer of psychoanalysis. This is presented with a simplicity that cannot offend the proudly intellectual inquirer while at the same time it adapts itself to those who must think more slowly and ploddingly. Even so it is not matter for a light hour's reading. Freud is in earnest; he manifests, as he has through these years of investigation, a sense of the seriousness of a task that deals with the manifold complexities of unconscious mental life. His subject is vast and must be compressed. He has spared no pains to traverse with his listener or reader the detailed steps which lead into the knowledge of the unconscious and into the human difficulties that are there entrenched. Only in this way has he won a knowledge of this territory throughout the years of his work. And always as he has worked he has become more convincingly impressed with the responsibility that was laid upon him when as a young man the conviction first came to him that here lay the factors of neurotic illness. He felt that he had no right to pass by the further discoveries made by him and Breuer and he impresses upon his audience the same sense of the inescapable importance of these facts. At least he himself must present his subject thus conscientiously, omitting no details simply because they may astonish or offend.

His audience—the book is a reproduction of a series of lectures—is frequently warned that they may leave the subject if they have lost interest or willingness to follow. Freud maintains the attitude

with which he has always worked. Since he could never reconcile it with his conscience to deny the truths which were forced upon him, it was his incumbent duty to press on in the face of opposition, maintaining the helm also when his truths were partially taken from him and distorted. In the same spirit he cautiously guides his audience along a path of investigation which by his method he really makes the hearer's own. There are of course the disadvantages of a necessarily brief presentation of a subject that reaches limitlessly in every direction. Therefore in spite of his deferential explicitness, one that at times would almost rouse the antagonism of the impatient, he cannot work out his evidence in each step of the discussion. He has done this, however, to an extent that makes of these lectures an unusual opportunity to enter with a master scientist himself into his work of investigation. Yet some few things must be taken from him on faith. But such is the candor with which all difficulties and uncertainties are presented and such is the deference to the objections which must arise that the reader's faith in the author's sincerity and the reality of his work is necessarily strengthened. The simplicity of the manner of approach is marked also by a quiet dignity in which the apparently objectionable quality of some of the facts of the unconscious mental life is lost in their inevitableness and in the recognition that they have to be truthfully faced.

The fact that the book was designed for popular instruction cannot in this case detract from its value to the specialist in the field of psychic disturbances. It carries with it a silent but no less forceful suggestion which belongs to the entire nature of psychoanalysis. This is that of the "human, all too human" nature of the problems with which a mental specialist has to deal, a matter which in the theory of mental diseases is too often overlooked. The opprobrium attaching to psychoanalysis has arisen from its fearless recognition of the intense significance, from the point of view of the illness a disastrous significance of the apparently trivial in the fate of any life and of the further fact that this "trivial" must also often be interpreted as that which is forbidden the spotless surface of conscious decorum. Not only does Freud give to these things added weight of importance and emphatic proof of their presence in every life but he makes clearer their interrelation as determining factors for the neuroses, for perverse conduct, for artistic outlet or ordinary healthy regulation of both conscious and unconscious traits, according to the ability of the individual. He teaches the causes for the variation of this ability with particular emphasis upon the reasons for the serious disturbances evident in the neuroses as they lie in fixations upon earlier stages of development or in regressions to these.

Mention might be made of the orderly sequence of the book through which the author initiates the reader into the hidden regions of unconscious content and the mechanisms which have such strange effect upon lives. He begins with the common ground of errors and forgettings and from this proceeds into the vast field of the dream. This leads into the second part of his discussions, the application of the insight thus gained to the neuroses themselves. Here also he

places before his readers in decisive manner the distinction between the psychoanalytic approach to mental disturbances and that of the older psychiatry which left unexplained the observed phenomena. Here again the presentation is adapted to the lay mind but is none the less true to the most fundamental application of psychoanalysis to the actual conditions of mental disease. There is much instruction and incitement to the trained psychiatrist and the practising psychoanalyst finds that helpful review of facts and methods which reinforce his insight and efficiency. Certain phases of the subject are treated with an especially clear conciseness, such as the part of the transference in treatment. The comparison of transference as a means of psychoanalysis on the one hand with suggestion and hypnotism on the other makes clear a point which has entangled the feet of many a critic. A very pregnant distinction is drawn between those forms of disturbance in which transference is effective and those in which the libido has been so withdrawn into the ego interests that transference cannot take place. The latter Freud calls the narcissistic neuroses. His emphasis upon this distinction therapeutically reveals his own cautious attitude whereby he makes no undue claims for psychoanalysis and yet is weighty with suggestion of the future possibilities toward which the knowledge of the unconscious leads. These here barely mentioned points of interest are typical of the many important truths which Freud's statement of psychoanalysis has presented and brought into peculiarly significant prominence. They are also indicative of the attitude of modest expectancy on the part of the founder of psychoanalysis for the extension of it in the future in relation to disease as well as elsewhere. This modesty on Freud's part as to the claims he is ready to make bespeaks an unprejudiced consideration of psychoanalysis on the part of his readers. At the same time his expressed hopes afford peculiarly direct stimulus for the work of the future.

Neutra, Wilhelm. SEELENMECHANIK UND HYSTERIE [PSYCHODYSTAXIE]. Vorlesungen ueber allgemeine und medizinisch angewandte Lustenergetik. [Psychosynthese.] F. C. W. Vogel, Leipzig, 1920.

The author is director of the nerve department of a state hospital and hydrotherapy institute and has written this highly interesting volume with the view of making hysteria an understandable phenomenon. How well he succeeds will depend upon each individual reader. We can only register individual impressions in somewhat hastily summarizing the author's method and view points.

The method is one of rather discursive lectures. There are twelve of them, making a volume of slightly more than five hundred pages. They are easy reading, however, clear and intelligent and the author develops his theme in leisurely fashion and entertainingly.

As may be seen from the title he commits himself to an energetic view point. Since this point of view is manifesting itself throughout all the natural sciences, biology should not linger, and medicine, especially that part of it which may be designated as psychological,

is in need of its formulations. His platform is, as he states in his preface, to present psychological phenomena from a monistic-dynamic standpoint and to avoid the mistakes of dualism on the one hand and materialism on the other. Since on the one hand man's speech development has more or less tended to the exaggeration of the dualistic program any attempt to present adequately a monistic philosophy is thereby rendered the more difficult, while on the other the jargon of the science of energetics exclusively founded upon physical terminology, thus tends to overemphasize materialistic generalizations and again renders the problem intricate. Nevertheless he would attempt a psychomechanics on a purely energetic basis. The argument is distinctly Bergsonian although not so well expressed, and no modern psychopathologist but would agree with the desirability and value of the program, especially in the emphasis laid upon the fact that psychology pervades all human life and no physician can be a really competent physician without an understanding of the part the psyche plays in human affairs, including its diseases. The spread of charlatanism, of all types of medical cults founded upon the mental basis is directly due to the important fact that the ruling schools of medicine have fallen into the swamp of a dualistic materialism and have neglected the most important of nature's products, the human psyche. He quotes Strümpell as saying "that thousands of charlatans and nature fakers have for centuries accomplished and still are, unconsciously, what the truly intelligent physician must learn to accomplish with conscious insight." Hippocrates found it true in his day—so also did Galen—and here it is again, the onesided materialistic thinking of the physician who neglects the cravings of the whole individual (the soul) to treat a limited structural anomaly.

But the author's discursive style has already influenced this review. He then develops the idea of the meaning and object of life and living matter. This brings him to a study of instinct and the energy that is expressed in pleasure striving. He then develops a distinctly hedonistic philosophy and a psychophysical parallelism. Optimism is the psychical value correlate of the instinct for satisfaction. The combination of all of the strivings of the human being in their phylogenetic synthesis the author calls the soul, and the "soul mechanics" is a study of the positive and inhibiting forces for the satisfaction of these constellated strivings. The instincts are now rapidly reviewed, those of self preservation and race propagation and others emphasized by Shand and MacDougall. His third chapter deals with the development of moral values and their function for the individual's control of his instinctive cravings. The instinctive and evolutionary development of ethics is touched upon. In the study of the details of individual psychology psychoanalysis is deemed a highly valuable means of learning facts about the individual which cannot be learned in any other way. The function of religion is very inadequately set forth by the author in this chapter on the psychology of morals.

Chapter four commences to touch on the immediate problem when he deals with "psychical emanations"—best translated "be-

havior"—being well or sick as depending upon interactivities of three components—the instinctive strivings, the forces of repression and the environmental factors. It has taken one hundred and thirty-four pages to arrive at this "obvious" dictum. This chapter now deals with environmental factors. Chapter five deals with a few Freudian mechanisms and advances to the idea of symbolism. Hysteria as an analogue to artistic production is discussed. They are both symbolizations of inner experiences. Methods of examination are dealt with here and in the next chapter where dream technic is taken up. The Freudian technic is appreciated, but evidently not quite grasped for he is of the opinion that the dream only deals with material already known and apparently obtainable by ordinary conversation. The energetic discharge function of the dream, which would be so valuable for his argument he does not develop. Chapter seven deals with the concept of the unconscious which naturally has been spoken of from the beginning since the Bergsonian concept of the unconscious has dominated. Three new terms are now introduced, *Præsidial Psyche*, *Normopsyche* and *Præpsyche*, practically synonymous with Freuds, *Conscious*, *Forconscious* and *Unconscious*. He also pays his respect to academic logic which he analogizes to a "working minority in the soul parliament." Logic is a purely practical device that is more or less in opposition to reality and truth. Logic is purely absolutistic, hence aprioristic—whereas psychologic takes into consideration the bipolarity of the energetic conception of life's processes. Idealism and materialism grow out of logic, each in opposing directions; since they hold mutually exclusive attitudes towards truth they are both wrong. A true psychologic attempts to combine them in a monistic concept.

We have thus gone about half way in this book and must leave the rest to the reader himself. Whether he will profit or not depends on his own view point. For ourselves the time spent seemed worth while, although it must be confessed we found many words, some new ideas, very few, but an entertaining and pleasing method of presentation.

In the slang of modern speech the author rarely "gets down to cases" but his highly intelligent juggling of principles is fascinating.

Notes and News

ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASES

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The first meeting will be held at the New York Academy of Medicine, 17 West 43d Street, New York, at 9:15 A.M., December 28 and 29, 1920.

For information regarding the program or any of the other arrangements of the meeting, please communicate with Dr. Foster Kennedy, Secretary, 20 West 50th Street, New York City.

PROGRAM

1. Presidential Address Dr. Walter Timme.
2. Etiology and Epidemiology, with especial reference to alleged relationship between Influenza and Encephalitis Lethargica. Dr. George A. Soper.
3. Serology Dr. Walter M. Kraus and Dr. Irving H. Pardee.
4. Pathogenesis and Experimental Pathology. Dr. Harold L. Amoss, Dr. Israel Straus and Dr. Leo Loewe, Dr. William Thalheimer.
5. Morbid Anatomy:
 - Microscopic and Naked eye Appearances of Nervous System in Encephalitis Lethargica..... Dr. William G. Spiller, Dr. James B. Ayer.
 - Morbid Anatomy Outside Nervous System..... Dr. William Boyd.
 - Brain Lesions from Inorganic Poisons like Lead, etc. Dr. G. B. Hassin.
6. Clinical Studies:
 - Prodromata Dr. I. Abrahamson.
 - Paralysis Agitans and Thalamic Types..... Dr. J. Ramsay Hunt.
 - Cerebral Types..... Dr. J. W. McConnell.
 - Cerebellar Types
 - Spinal Types..... Dr. Henry Alsop Riley.

- Radicular and Peripheral Types.....Dr. Foster Kennedy.
 TreatmentDr. Edwin G. Zabriskie.
7. Prevention:
 ImmunologyDr. Harold L. Amoss.
 Psychotic Types. Dr. George H. Kirby and Dr. Thomas E. Davis,
 Dr. Menas S. Gregory.
8. Studies on the Question of the Relation between Poliomyelitis and
 Encephalitis.....Dr. William B. Cadwalader, Dr. I. Neustaedter.
9. Diagnostic CriteriaDr. Lewellys F. Barker.
10. Prognosis
11. Additions to Physiological Knowledge through Symptoms complex of
 Encephalitis LethargicaDr. Frank H. Pike
12. Ocular ManifestationsDr. Ward A. Holden.
13. Vestibular Manifestations.....Dr. Isaac Friesner.
14. StatisticalDr. I. S. Wechsler.
15. Bibliography
16. Encephalitis among the Feeble-minded.....Dr. Karl Menninger.

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